Information Brief

STRATEGIC MOBILITY/COMBAT LOGISTICS

tp://www.usn.hq.navy.mil/n4

20 September 2004
Merchant Marine Academy

Mr. Jon Kaskin
OPNAV N42

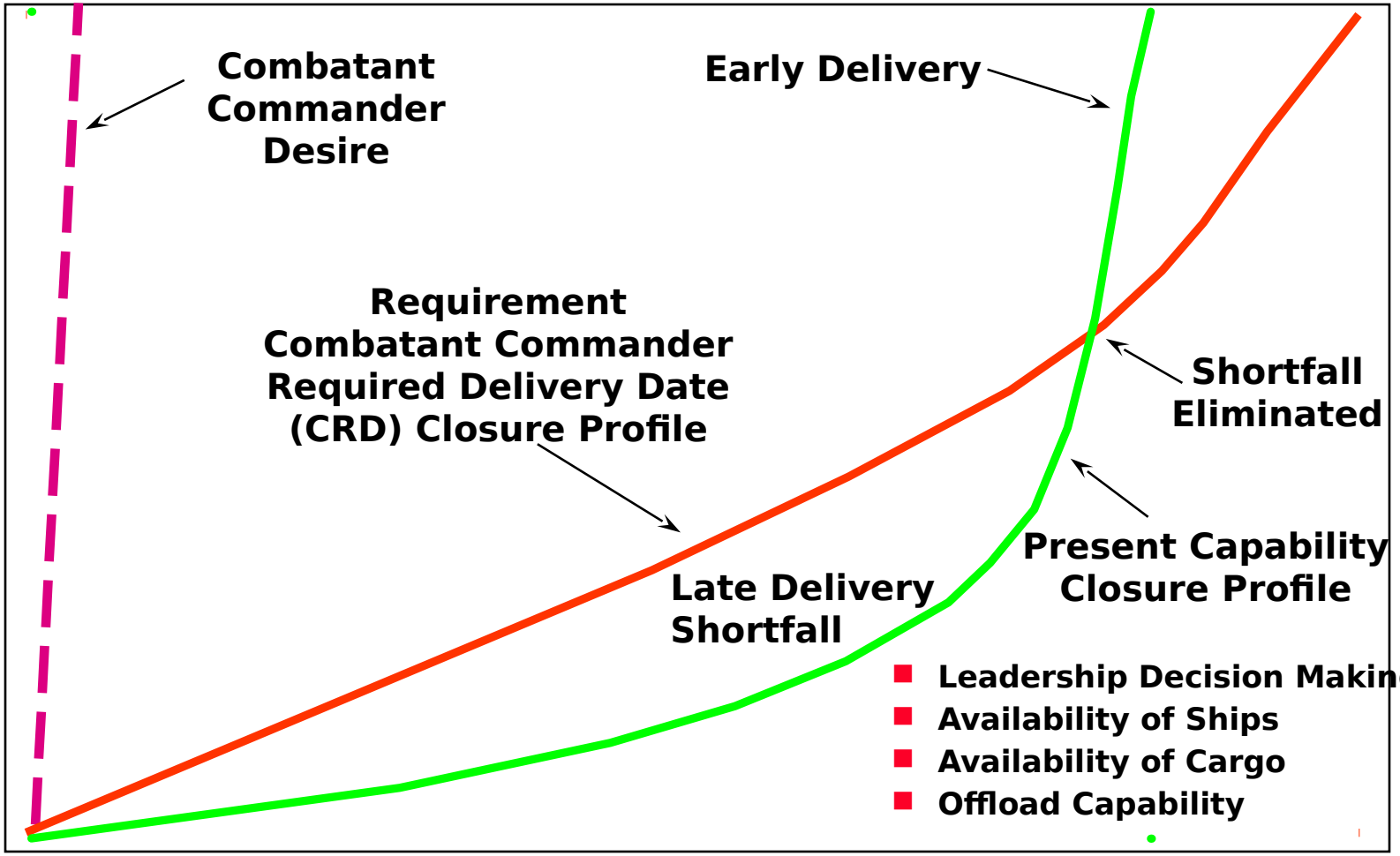
Briefing Outline

- **Definition of Strategic Sealift**
- **Sealift Requirements**
- **Sealift Assets**
  - Commercial
  - Government
- **Sealift Acquisition Programs**

Definition of Strategic Sealift

- **The Transportation of Surge Unit Equipment, Sustaining Ammo, Petroleum, and Supplies**
- **Prepositioning of Military Cargoes Afloat**
- **Systems to Move Shipborne Cargo Ashore**

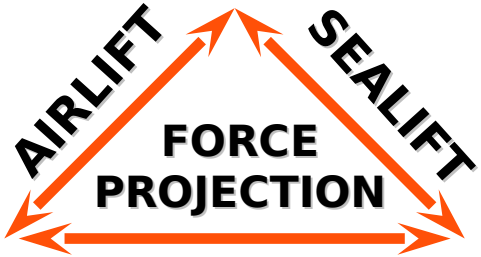
Total Delivery Requirements



Balanced Mobility

AIRLIFT

- Fast
- Limited Capacity (5%)



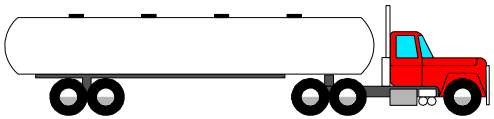
SURGE SEALIFT

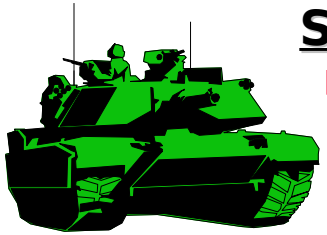
- Cost Effective
- Large Capacity (95%)

PREPOSITIONING

PREPOSITIONING ASHORE

- Europe
- SWA
- Korea

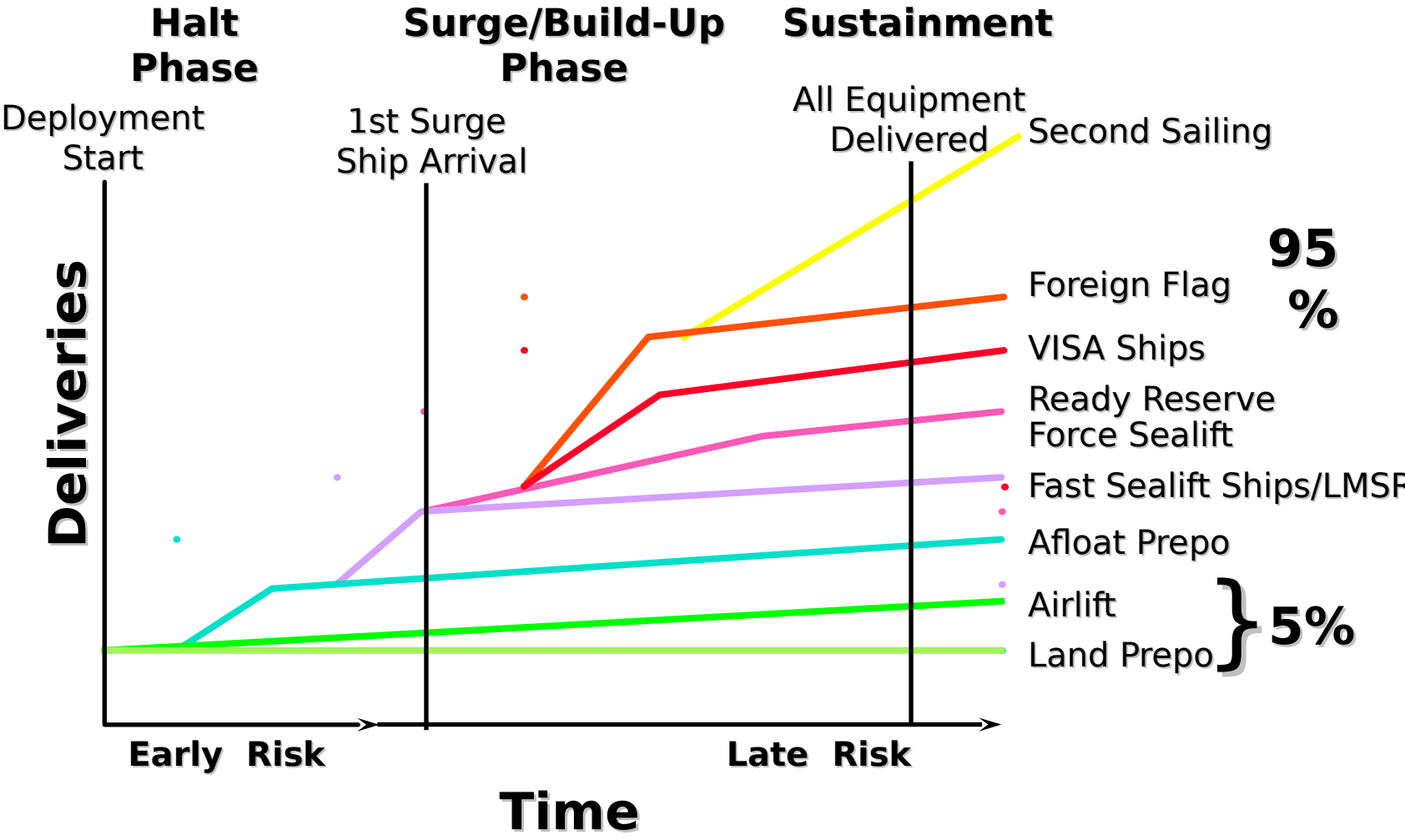




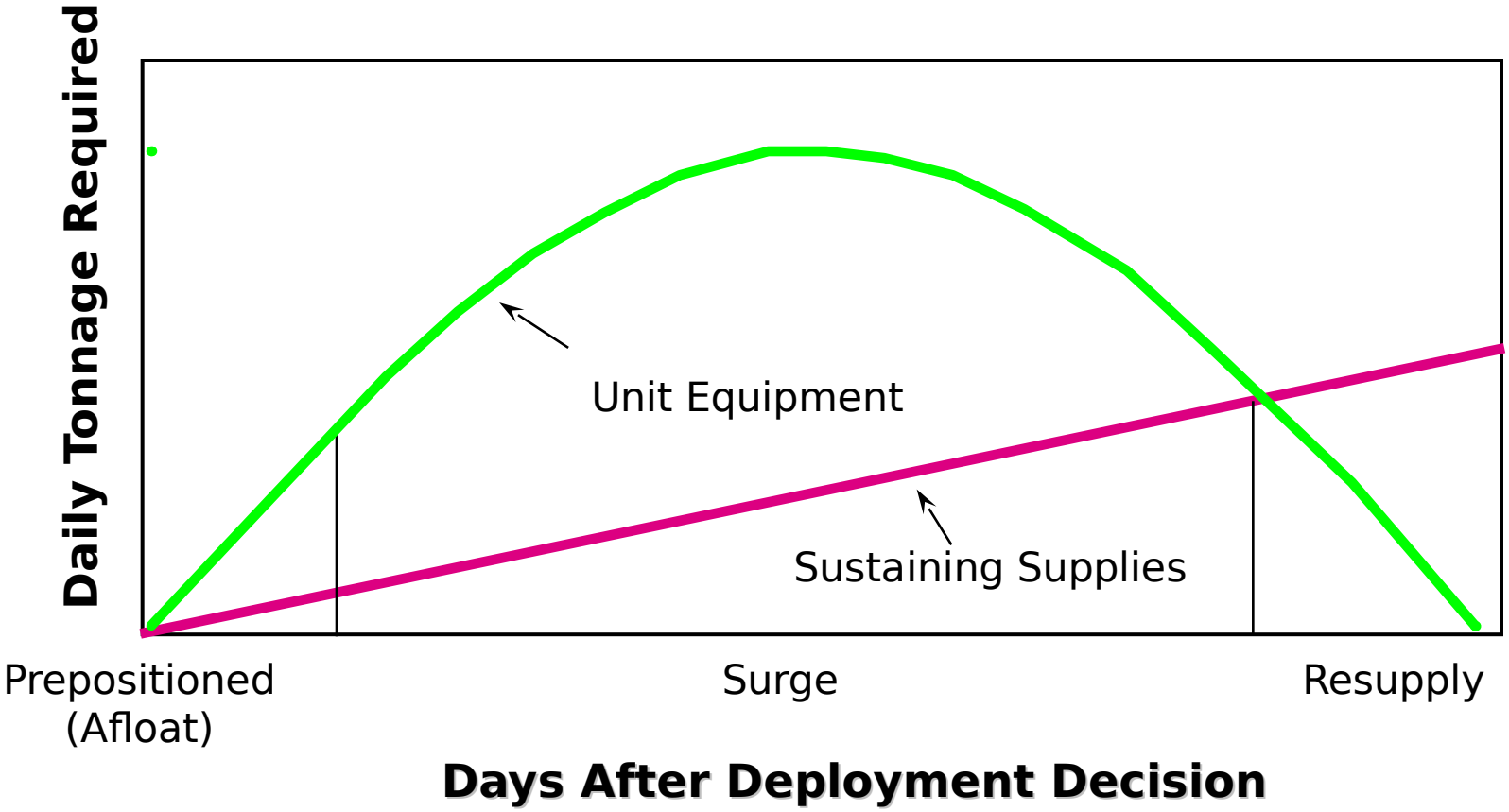
PREPOSITIONING SEALIFT

- MPS (USMC)
  - Guam
  - Mediterranean
  - Diego Garcia
- APS (Army/USAF/Navy/DLA)
  - Guam
  - Mediterranean
  - Diego Garcia

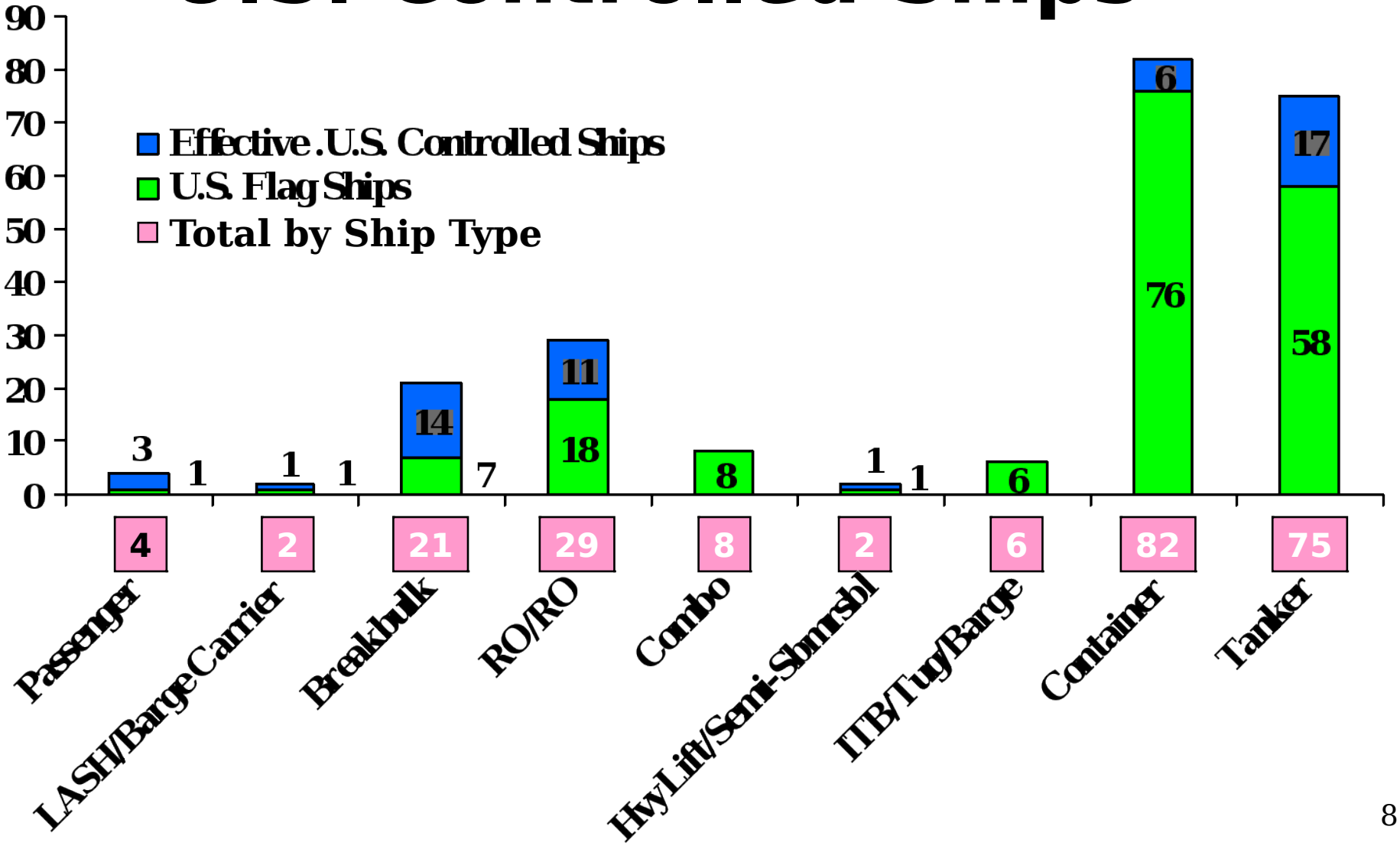
Generic Mobility Options



Sealift Requirements



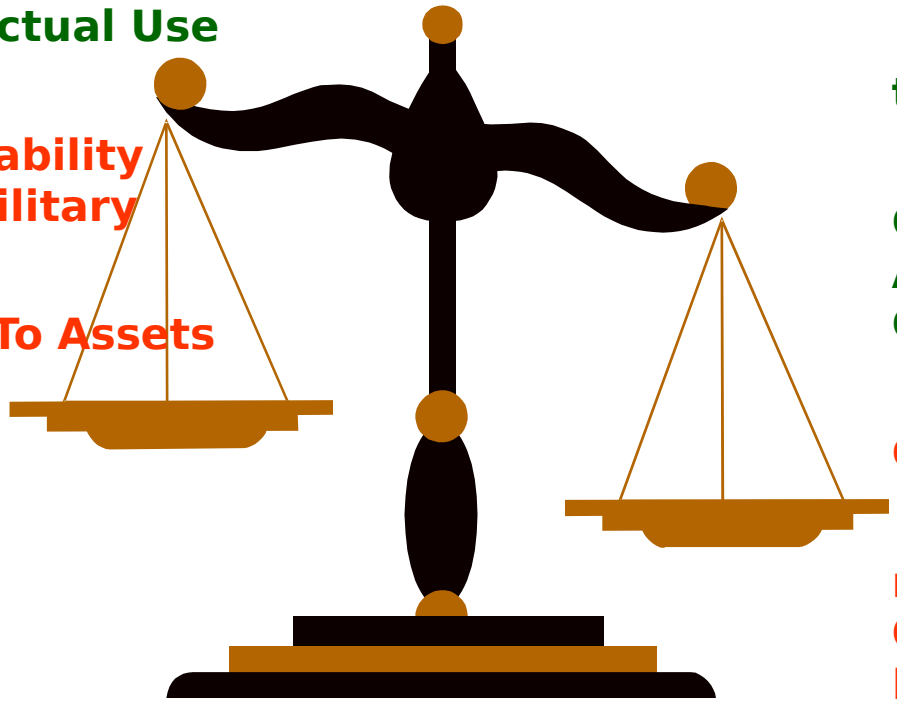
Militarily Useful U.S. Flag & Effective U.S. Controlled Ships



Mobility Challenge

Commercial Capability

- Charter As Required -- Cost Limited To Actual Use of Ship
- Commercial Capability May Not Match Military Need
- Delay in Access To Assets



Organic Capability

- Immediate Access to Capability.
- Includes Unique Capabilities Not Available in Commercial Sector
- Requires Large Capital Investments
- Ongoing requirement to fund Operations and Maintenance

The Challenge

- **Adequate Number of Ships to Meet RDD's**
- **Type:**
  - Matched to Cargo
- **Availability:**
  - Matched to Deploying Unit Availability
- **Capacity:**
  - Matched to COCOM Warfighting Requirement

Evolution of Mobility Requirements

Jan 92 **Mobility Requirements Study (MRS)**
- 1999 Threat
  - SouthWest Asia Scenario Sealift Driver
    - Generated Requirements for LMSR Program
      - 2 Million Sq Ft afloat prepo/3 Million Sq Ft of Surge Sealift
      - RRF Expansion

93 - 94 **Significant Changes Since MRS**
- Bottom Up Review
  - Downsized Force Structure
    - 2 MRC Strategy

Mar 95 **MRS BURU**
- 2001 Threat
  - 10 Million Sq Ft of Surge Sealift
    - RRF Reduction

May 97 **QDR: No changes**

MRS-05: Sealift - **No changes**
Airlift - Additional procurement

Jan 01 **QDR: No Surge changes**

Oct 01 **Joint Staff Heavylift study**
Mobility Capabilities Stu

FY 04/05 **QDR**

MRS Sealift Requirement Driver

- **Southwest Asia MRC Principal Scenario**
  - All Others Secondary, Does Not Address Dual MRCs
- **Moderate Early Risk (C+14)**
  - Heavy Brigade
- **Moderate Late Risk**
  - 2 Heavy Divisions (C+30)
  - Combat Forces (C+52) 4 $^{2}/_{3}$ Divisions Total
- **Medium Confidence/Medium Cost Option**

MRS Integrated Plan

- √ **Interim Prepositioning Program:**
  - Interim Charter Ships (Thru FY97)

+

- √ **Prepositioning Program:**
  - Build 8 Large Medium Speed RO/ROs (LMSR)

+

- √ **2 Prepositioned Container Ships**

+

- √ **Surge Sealift:**
  - Build 6 LMSRs
  - Buy & Convert 5 Containerships to LMSRs

+

- ■ **RRF :**
  - 104 Dry Cargo Ships
  - 36 Tankers

+

- √ **Continued C-17 Program**

MRS BURU (1995)

- **Validated MRS LMSR & RRF RO/RO Acquisitions**
- **Modified MRS Plan as Follows:**
  - Shift 1 LMSR Or 2 RRF RO/ROs From Surge To Prepo Role
  - Reduced RRF From 104 To 65 Dry Cargo Ships
  - Established Afloat Prepositioning Requirement Of 4.3M sqft
  - Established Requirement For 10M SqFt CONUS Surge By 2001:
    - FSSs: 1.3M
    - LMSRs 3.0M
    - **RRF Other 1.6M**
    - **RRF RO/RO (36) 4.1M**

      Total 10M
- **Validated 120, C-17 Buy. Established MTM/D Requirement Range (49.4 - 51.8 MTM/D)**

MRS 2005

- **FY 2005 Strategic Sealift Fleet Adequate**
  - Early Activation of Commercial Sealift Through The Voluntary Intermodal Sealift Agreement (VISA) And Containerization Of Army Unit Equipment Reduces Closure By 2 To 3 Weeks
  - Heavy Lift requirements can be satisfied by transporting assets in cradles on organic sealift
- **FY 2005 Strategic Airlift Fleet is Sufficient For Two Sequential MTWs If The Total Fleet Is Dedicated To The Strategic Flow**
  - Additional Demands For Strategic Airlift Exist Outside Of The MTW Strategic Flow (e.g., Intratheater Requirements)
  - Additional C-17s May Be Required
  - New MTM/D (CRAF & Organic) Objective of 54.5 MTM/D

Future Sealift Requirements Tending Toward High S

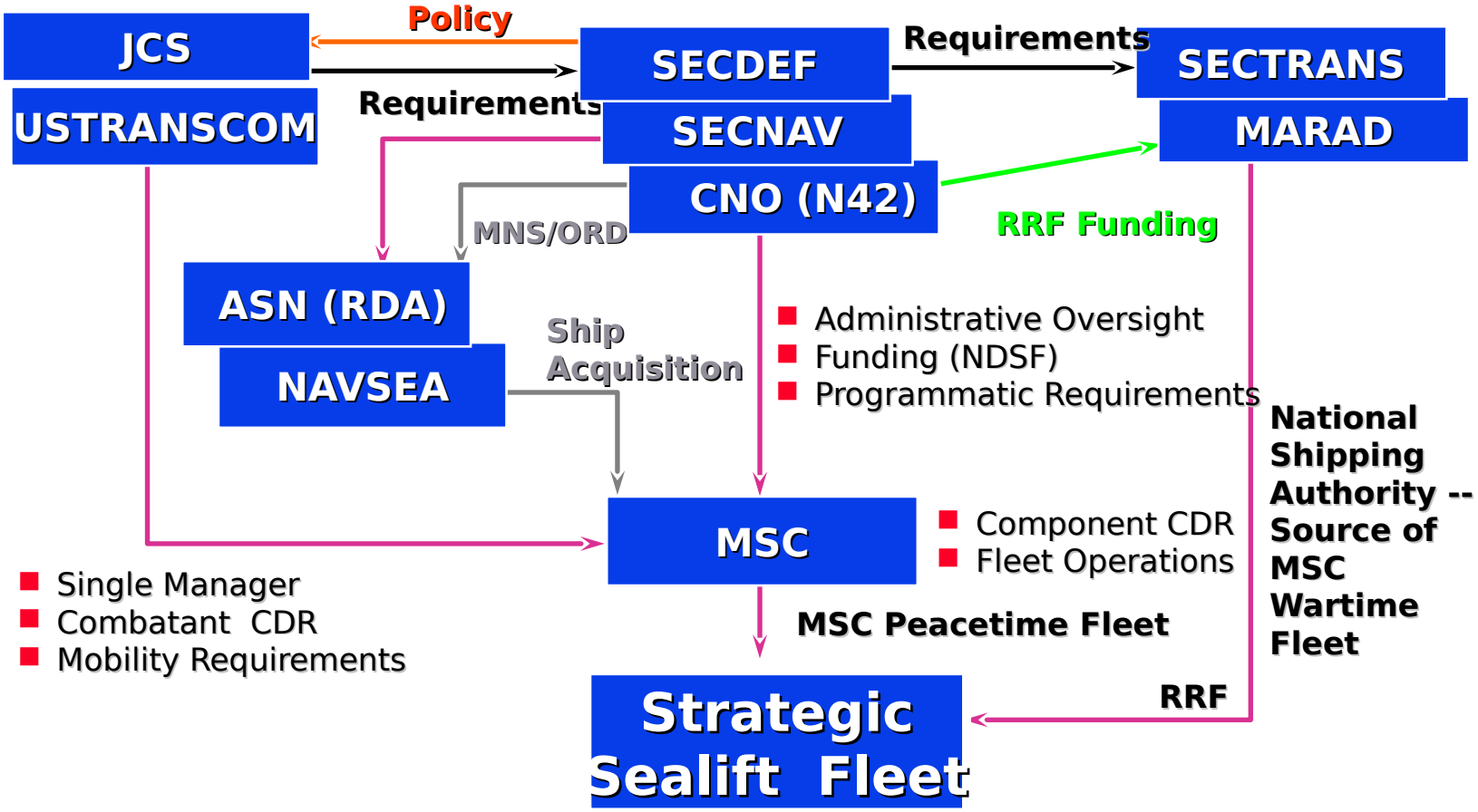
Heavy Lift Study

- **The Defense Planning Guidance 2003-2007 directed Navy to complete a study to address heavylift requirements.**
- **Recommendations**
  - Cancel cradle program, long-term Navy MIW program precludes the need for long-term transportation solution.
  - Forward station MCM vessels in the Pacific AOR to meet combatant commander requirements.
  - Until vessels are forward stationed, spot charter FLO/FLO vessels when required.
  - USTRANSCOM and MARAD should enroll at least two heavy lift vessels in the MSP to support FLO/FLO operations.

Mobility Capabilities Study

- **Changes from MRS-2005**
  - 1-4-2-1 Strategy
  - 10-30-30 Response
  - 2012 Force Structure/Threat
  - 2024 Advanced Technology Excursion
  - New Conops (Seabasing)
  - Force changes (Units of Action)

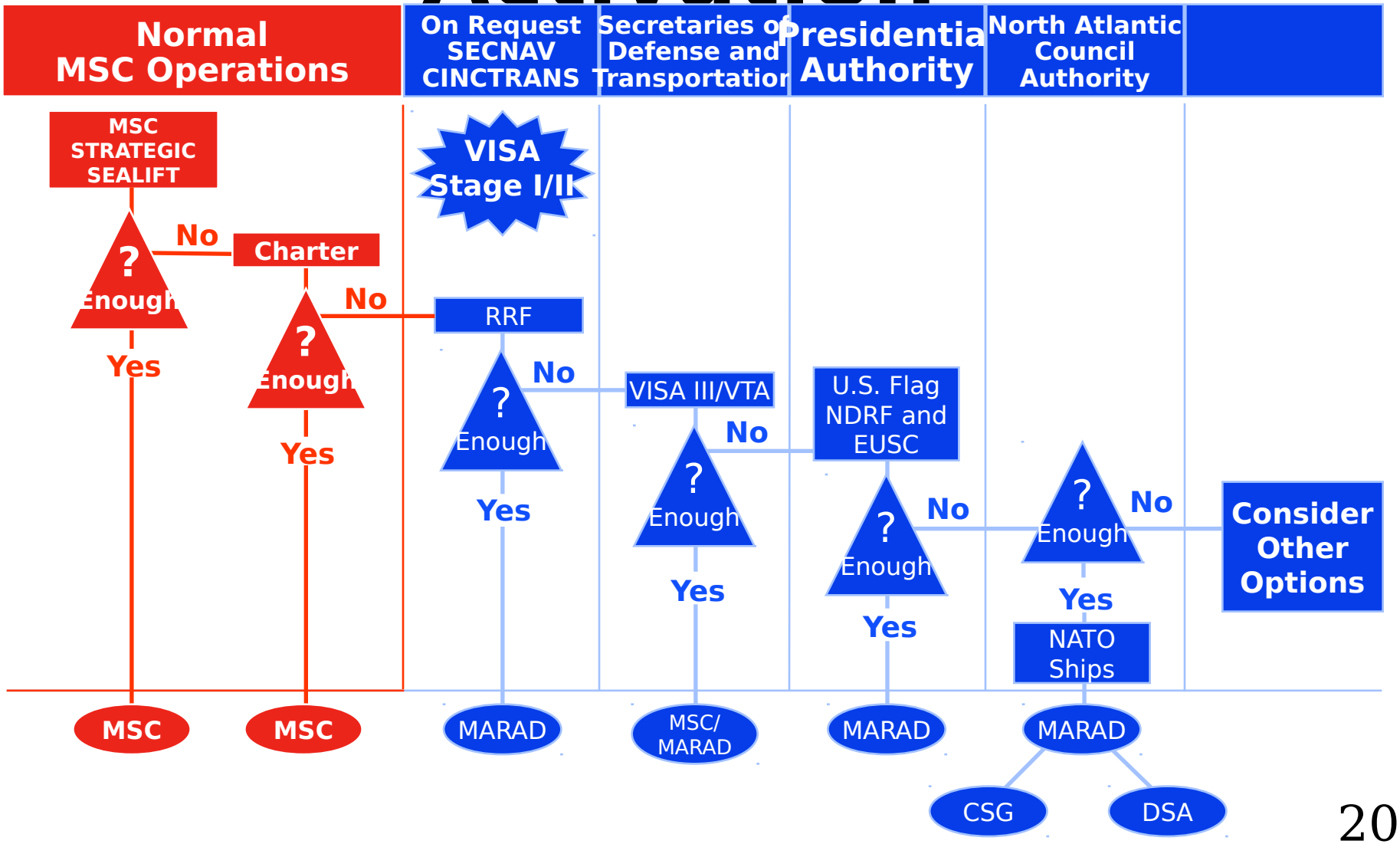
Sealift Team Is Complex



National Security Sealift Policy

"…First, the U.S.-owned commercial ocean carrier industry, to the extent it is capable, will be relied upon to provide sealift in peace, crisis, and war. This capability will be augmented during crisis and war by reserve fleets comprised of ships with national defense features that are not available in sufficient numbers or types in the active U.S.-owned commercial industry…"

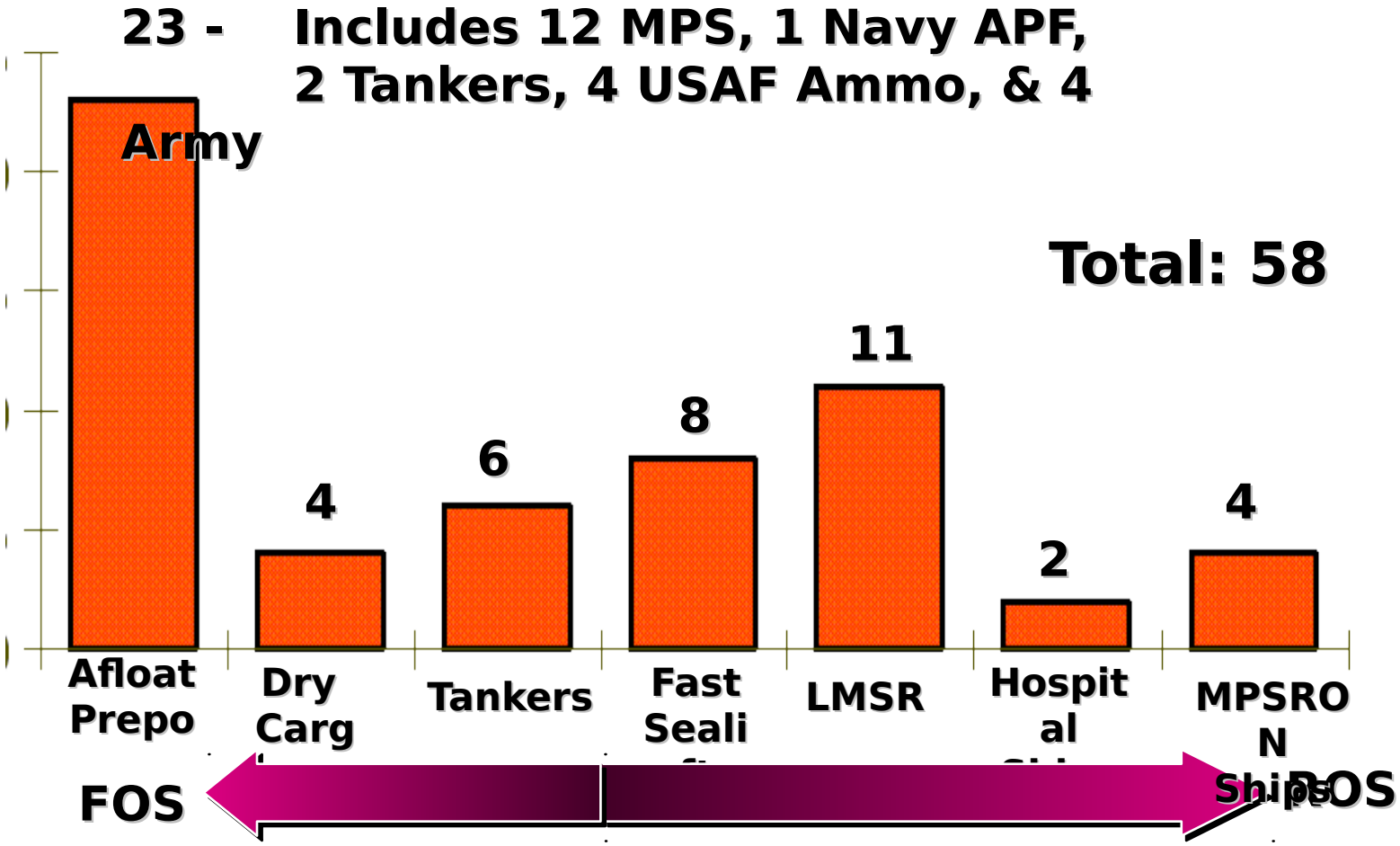
Normal Sequence of Sealift Force Activation



Organic Sealift
MSC Strategic Sealift Force

- **Dry Cargo And Tanker Fleet (10 Ships)**
  - Sized To Meet DoD Requirements That Cannot Be Met By Scheduled Commercial Sources
  - Ships Under Charter To MSC
  - 4 Government owned T-5 tankers
- **Afloat Prepositioning (33 Ships) (Current OIF : 23 ships)**
  - Used To Meet MTW And SSC Early Requirements
  - Normally includes Ships Under Charter (19), MPF (E) (3), LMSRs (8), And RRF (3) Ships
  - Currently MPSRON 2 in ROS; Army has 2 LMSRs and 2 container ships
- **FSS and LMSR Surge Ships and Hospital Ships Maintained in Reduced Operating Status (ROS) (21 Ships)**
  - Restrictions On Ships' Use To Move Peacetime Cargo

MSC Strategic Sealift Force
20 August 2004



Note: MPRSON vessels will return to prepo fleet,
Army vessels will return to a level of 10

Today's MPF

- **Three Squadrons Comprising 16 Ships**
  - MPS-1 - Atlantic (5)
  - MPS-2 - Diego Garcia (6)
  - MPS-3 - Pacific (5)
- **Personnel By Air, Equipment/Material By Sea**
- **Ships Offload At Available Port Or In-Stream**
- **Requires Secure Area**
  - Arrival/Offload Of Ships And Aircraft
  - The Joining Of Personnel And Material
- **C**

MPSRON 2 offloaded for OIF
Ships in ROS

MPSRON 1 offloaded for OIF
Will Reconstitute by Mar 2005

Maritime Prepositioning Ship (MPS)

Maersk Line

LOA: 756’
Beam: 90’
Draft: 33’
Speed: 16.4 kt
DWT: 23,000 TN

140,000 ft²
378 TEU

Diesel
Range: 15,000 NM

NASSCO Conversion

Large, Modern High-Speed Containership

Strategic Sealift Ship

USNS BOB HOPE

AVONDALE NEW CONSTRUCTION

LOA: 950’
Beam: 105.8’
Draft: 34.6’
Speed: ~24 kt
DWT: 27,000LT

387,000 ft²

Diesel Range: 12,221 NM

LMSR Key Parameters

- **Total Capacity:**
  - Prepo - 2M SqFt (APS3)
  - Surge - 3M SqFt
- **Capacity Per Ship:**

	Total	Enclosed
– Conversion:	300K SqFt	225K SqFt
– New Construction:	380K SqFt	300K SqFt

- **RO/RO & LO/LO Cargo Handling Capability**
- **Load/Offload in 96 Hours Pierside**
- **Sustained Speed 24 Knots**
- **Range 12,000 NM**
- **DWT 19,000 LT**
- **PANAMAX**

Fast Sealift Ship (FSS)

USNS CAPELLA

LOA: 946’
Beam: 106’
Draft: 37’
Speed: 30+kt
DWT: 24,000 LT

189K SqFt

Steam Turbine
Range: 9,400 NM

Build: 1972-3
Converted: 1984

FSS Key Parameters

- **Capacity Per Ship:**
  - ALGOL class 189K SqFt
  - ANTARES class 183K SqFt
- **RO/RO & LO/LO Cargo Handling Capability**
- **Load/Offload in 96 Hours Pierside**
- **Endurance Speed 27+ Knots**
- **Range 12,200 NM**
- **DWT 14,300 LT**
- **PANAMAX (breadth =106')**

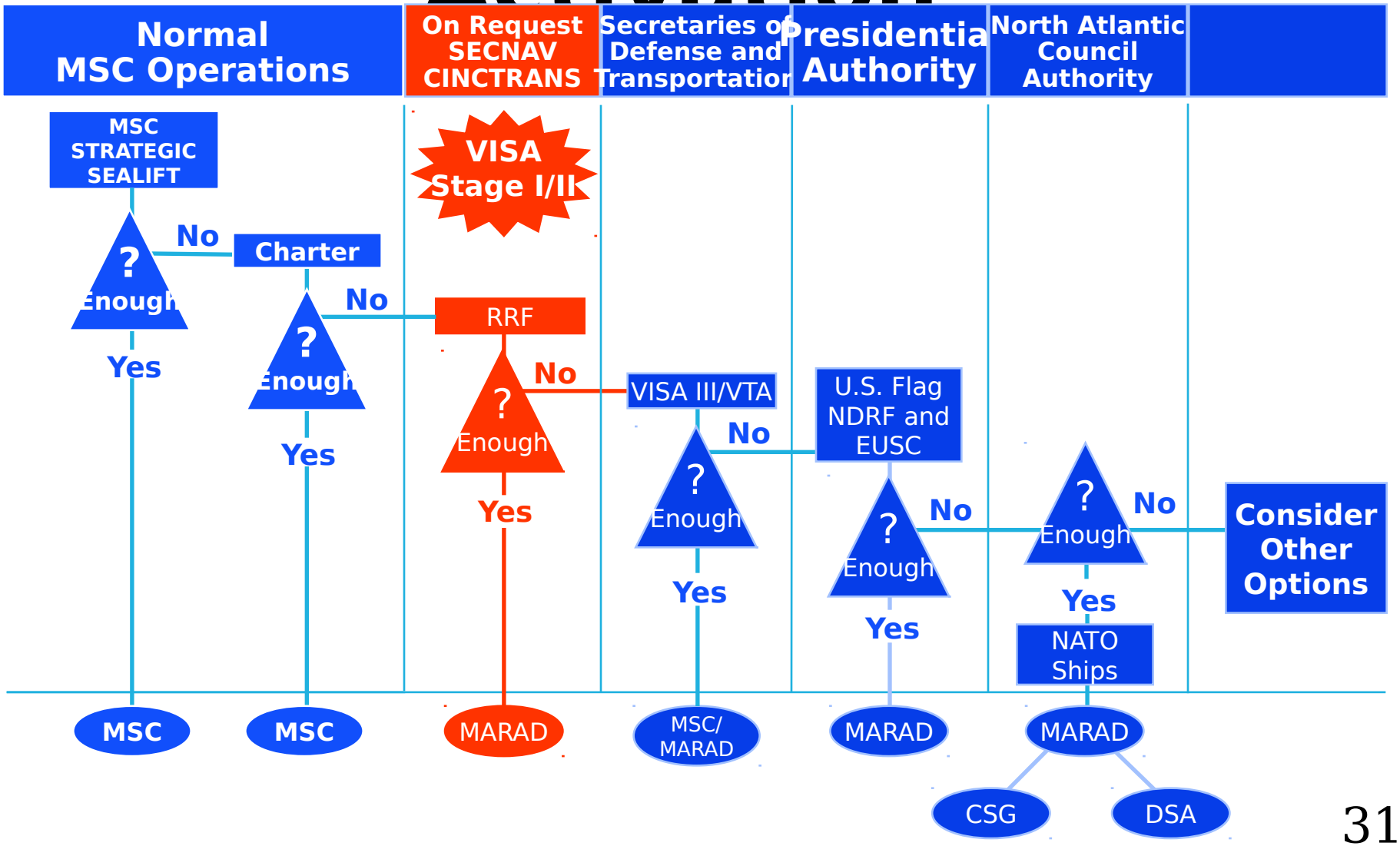
T-AH 19 MERCY

Built: 1976
Converted: 1985
LOA: 862’
Beam: 106’
Draft: 33’
Speed: 17.5 KTS
Steam Turbine
Range: 13,240NM
VERTREP Deck

O.R.: 12
Beds: 1,000
- 100 Acute care
- 400 Intermedia
- 500 Min. Care

Readiness State I
- # of Patients/d
- 300/day for 1da
- 200/day for 3da
- 100/day sustained

Normal Sequence of Sealift Force Activation

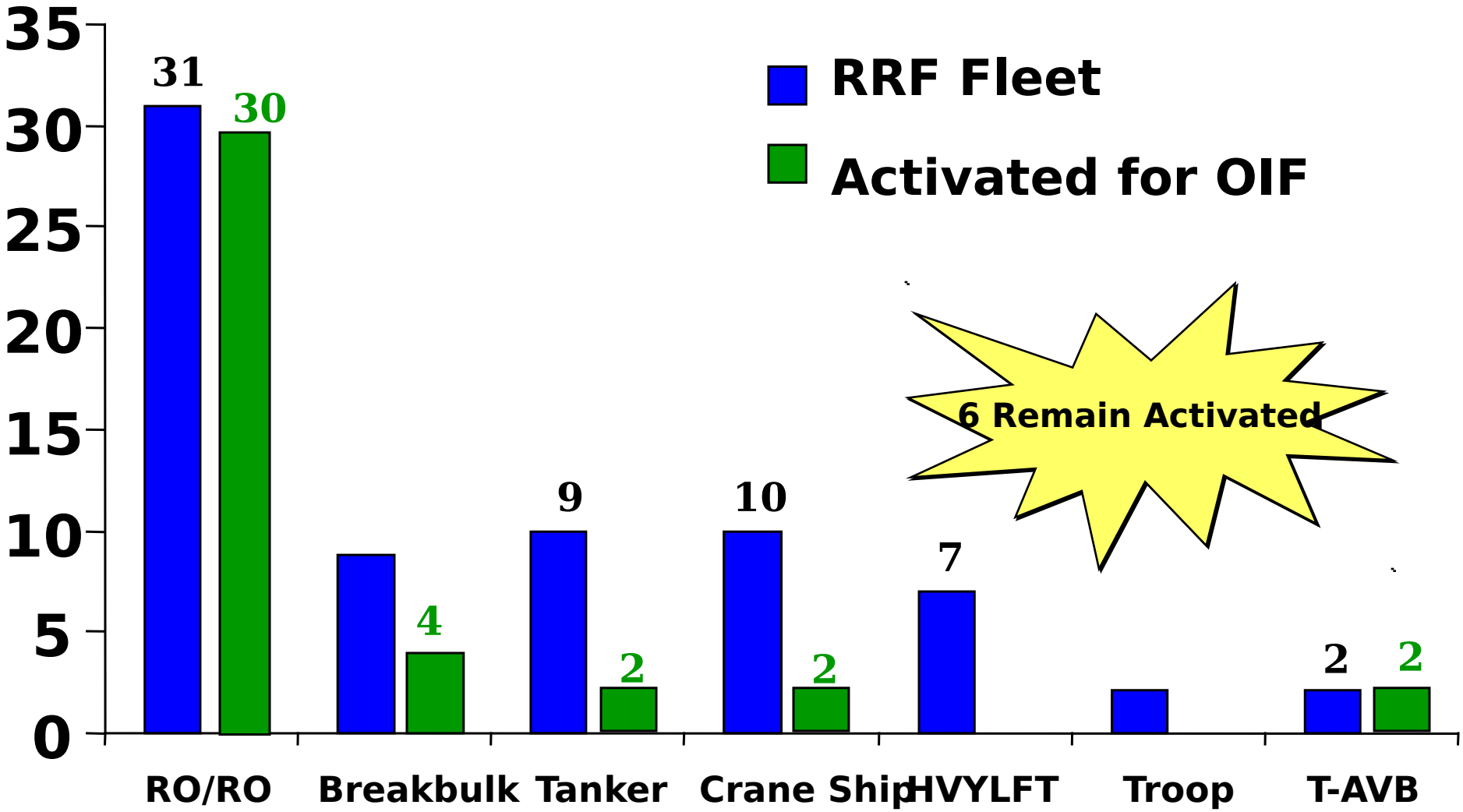


Organic Sealift Ready Reserve Force

- **68 Ships Maintained In 4, 5, 10 and 20-Day Readiness Status (To be reduced to 59 in FY05, 57 in FY06/7)**
- **Contains Dry Cargo Ships (RO/RO, Breakbulk, Heavylift, Auxiliary Crane Ships); Tankers; and Special Mission Ships (e.g., Aviation Logistics Support Ship)**
- **Significant Restrictions On Peacetime Use**

***Ships removed in FY05*:**	**3 BB, 1 SEABEE, 2 Troopships, 2 Tankers, 1 Combination**
Ships removed in FY06/7:	**2 OPDS**

Ready Reserve Force



RRF RO/RO

Cape Orlando

LOA: 635’
Beam: 92’
Draft: 30’
Speed: 16.2 kt
DWT: 21,000TN

Cargo Capacity:
Vehicle:
204,000ft²

Diesel
Range: 15,700 NM

LASH

LOA: 893’
Beam: 100’
Draft: 41’
Speed: 18.7kts
DWT: 40,710

Diesel Range: 15,000 NM

Offshore Petroleum Discharge System (OPDS)

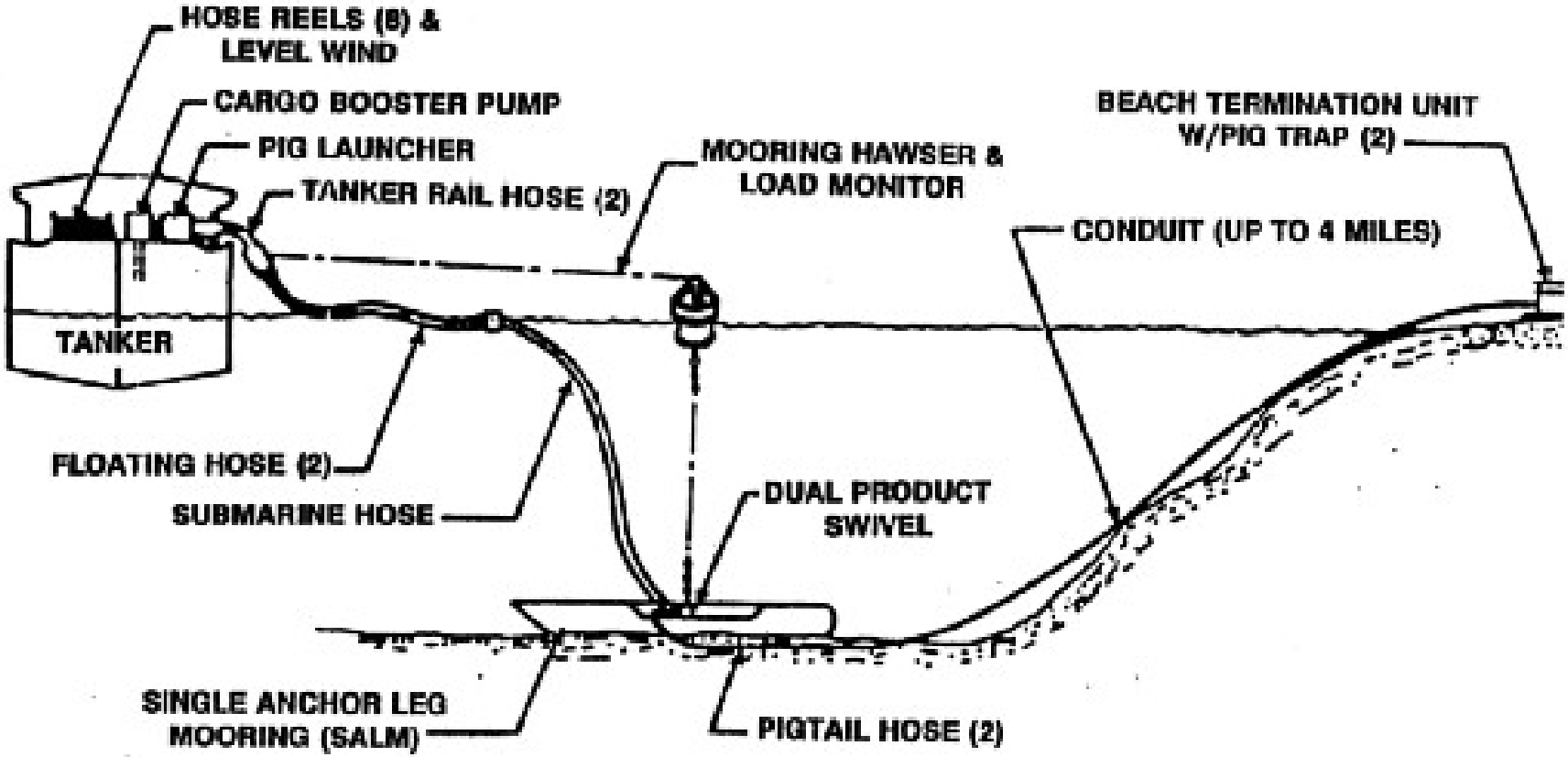
American Osprey

LOA: 661’
Beam: 90’
Draft: 36’
Speed: 16 kt
DWT: 34,175

268,000 BBL

Diesel Range: 14,000 NM

Offshore Petroleum Discharge System (OPDS)



Auxiliary Crane Ship

Flickertail State

LOA: 610’
Beam: 78’
Draft: 32’
Speed: 17 kt
DWT: 16,343

952,000 ft²

Diesel
Range: 18,000 NM

Modular Cargo Delivery System (MCDS) Ship

CAPE GIBSON

LOA: 572’
Beam: 75’
Draft: 30.5’
Speed: 17.9 kt
DWT: 13,000 LT

42,800 ft²

Steam Turbine
Range: 13,300 NM

ROS Status: 5

CART Team:

Aviation Logistics Support Ship (T-AVB)

SS WRIGHT

LOA: 602’
Beam: 90’
Draft: 34’
Speed: 18.7 kt
DWT: 15,694

Steam Turbine
Range: 9,000 NM

RRF Readiness

- **ROS-4 or ROS-5 Criteria:**
  - Require No Shipyard Activation Work
  - Outported At Or Near Their Proposed Seaport of Embarkation
  - Cadre Crew Aboard (9-10)
- **RRF Readiness Levels -- FY 2005**

ROS-4	2 T-ACS
ROS-5	2 BB, 2 T-AVB, 27 RO/RO, 4 T-ACS, 2 SEABEE, 1 LASH , 1 OPDS
RRF-10	4 RO/RO, 3 LASH, 3 Tankers, 1 OPDS. 1 T-ACS
RRF-20	3 T-ACS

***Excludes 1 RRF Ships in Afloat Prepo (1 MCDS).**

Surge Sealift Siting

Bremerton, WA
T - Beaver State 4
T- Green Mountain State 4

Tacoma, WA
R - Cape Intrepid 5
R - Cape Island 5

Suisun Bay, CA RF
R - Comet 10
R - Meteor 10

San Francisco
R - Cape Henry 5
R - Cape Horn 5
R - Cape Hudson 5
OP - Mount Washington 5

Alameda, CA
B - Cape Gibson 5 MCDS
B - Cape Girardeau 5 MCDS
T - Gem State 5
T - Grand Canyon State 4
T - Keystone State 5
S - Cape Mohican 5
R - Adm Callaghan 5
R - Cape Orlando 5

Long Beach
L - Cape Fear 10
R - Cape Inscription 5
R - Cape Isabel 5

San Diego
A - Curtiss 5

PREPO - Diego Garcia
B - Cape Jacob 5 MCDS
OP - Chesapeake 5

PREPO - Guam
OP - Petersburg 5

Updated 18 May 04

Ship	West	Gulf	East	Prepo	Total
B - Breakbulk	2	1	4	1	8
L - Lash	1	3	0	0	4
S - Seabee	1	0	2	0	3
O - Tanker	3	2	0	0	5
OP - OPDS	1	1	0	2	4
R - Ro/Ro	11	7	13	0	31
T - Tacs	5	2	3	0	10
TP - Troopship	0	0	1	0	1
T-AVB	1	0	1	0	2
FSS	0	4	4	0	8
LM - LMSR	0	5	6	0	11
Total	25	25	34	3	87

Houston, TX
R - Cape Taylor 5
R - Cape Texas 5
R - Cape Trinity 5
T - Diamond State 4
T - Equality State 4

Tsuneishi, Japan
O - Alatna 10
O - Chatahoochee 10
O - Nodaway 10

Beaumont RF
L - Cape Farewell 10
L - Cape Flattery 10
L - Cape Florida 5
O - Mission Buenaventura 20
O - Mission Capistrano 20

Port of Beaumont
R - Cape Victory 5
R - Cape Vincent 5

Corpus Christi
LM -Benavidez 4

New Orleans
R - Cape Kennedy 5
R - Cape Knox 5

Violet, LA
FSS - Algol 4
FSS - Pollux 4
LM - Pililaau 4
LM - Fisher 4
LM - Brittin 4
LM - Bob Hope 4

FSS - Bellatrix 4
FSS - Altair 4

Fort Schuyler, NY
TP - Empire State 10

Buzzards Bay, MA
B - Enterprise 10

Phila, PA
LM - Mendonca 4
LM - Seay 4

Baltimore, MD
R - Cape Washington 5
R - Cape Wrath 5
A - Wright 5
LM-Shughart 4
LM-Yano 4

James River RF
B - Cape Nome 10
S - Cape Mendocino 10
B - Cape Johnson 20 MCDS
B - Cape Juby 20 MCDS

Norfolk, VA
FSS - Regulus 4
FSS - Denebola 4
S - Cape May 5

Newport News, VA
LM - Gilliland 4
LM -Gordon 4
T - Flickertail State 5
T - Cornhusker State 5
T - Gopher State 10

Portsmouth, VA
R - Cape Race 5
R - Cape Ray 5
R - Cape Rise 5

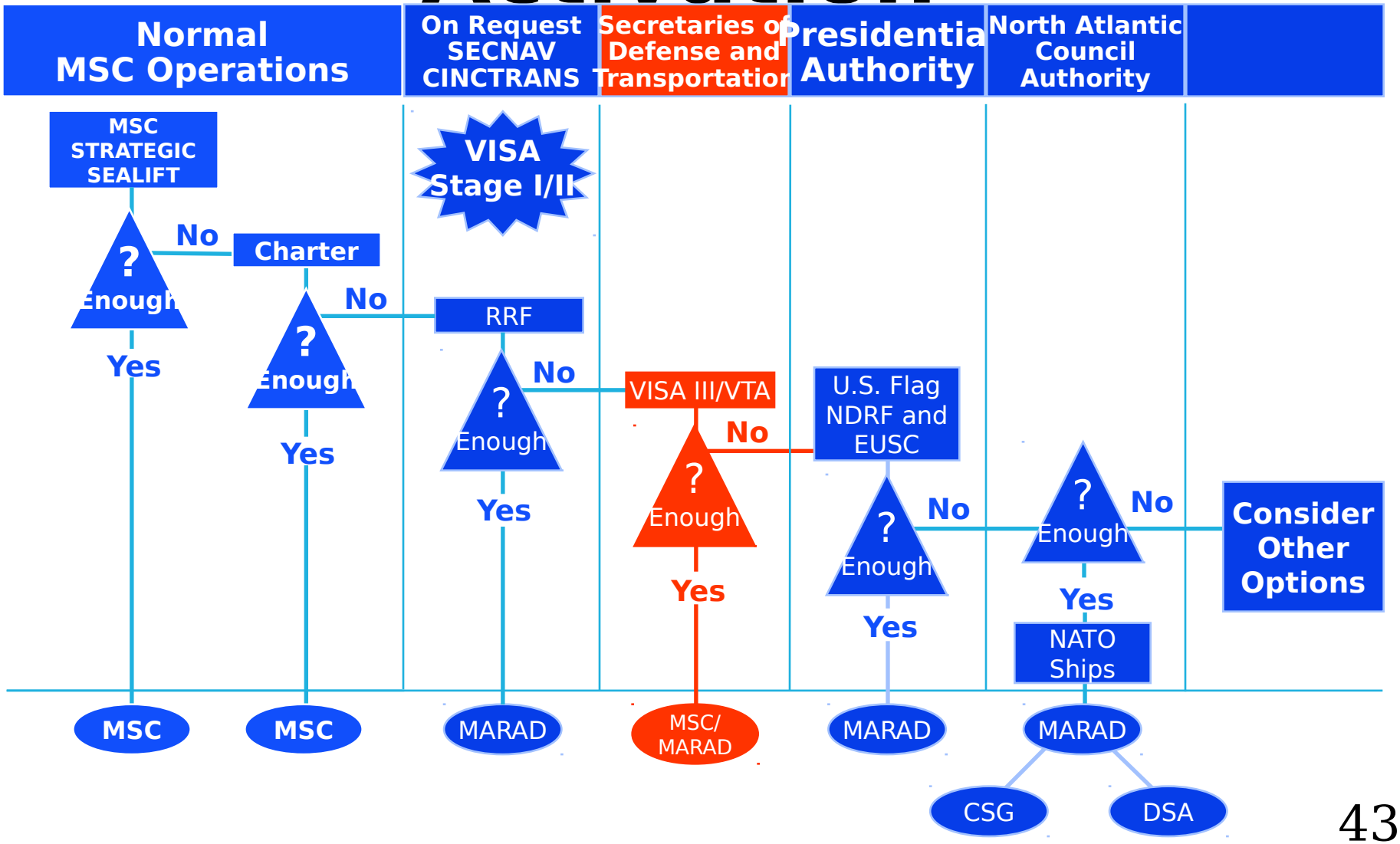
Charleston, SC
R - Cape Decision 5
R - Cape Diamond 5
R - Cape Domingo 5

Jacksonville, FL
R - Cape Douglas 5
R - Cape Edmont 5
FSS - Capella 4
FSS - Antares 4
R - Cape Ducato 5

Wilmington, NC
R - Cape Lambert 10
R - Cape Lobos 10

RO/RO MCDS FSS LMSR Other RRF

Normal Sequence of Sealift Force Activation



SRP/VISA/VTA

- **Sealift Readiness Program (SRP)**
  - A Formal Agreement Between U.S. Flag Dry Cargo Carriers and MSC
  - Similar to USAF CRAF
- **Voluntary Intermodal Sealift Agreement (VISA)**
  - Replacement for SRP
  - Provides System Capacity Vice Ships/Containers (% of VISA Enrolled Capacity)
- **Voluntary Tanker Agreement (VTA)**
  - Provides for Voluntary Contribution by Owners and Operators of U.S. Flag & EUSC Tankers
- **Will be Activated Before Requisitioning If:**
  - Defense Requirements Not Met by Chartering
  - Defense Requirements Met More Efficiently by Activating These Programs Rather than by Requisitioning Ships

Voluntary Intermodal Sealift Agreement (VISA)

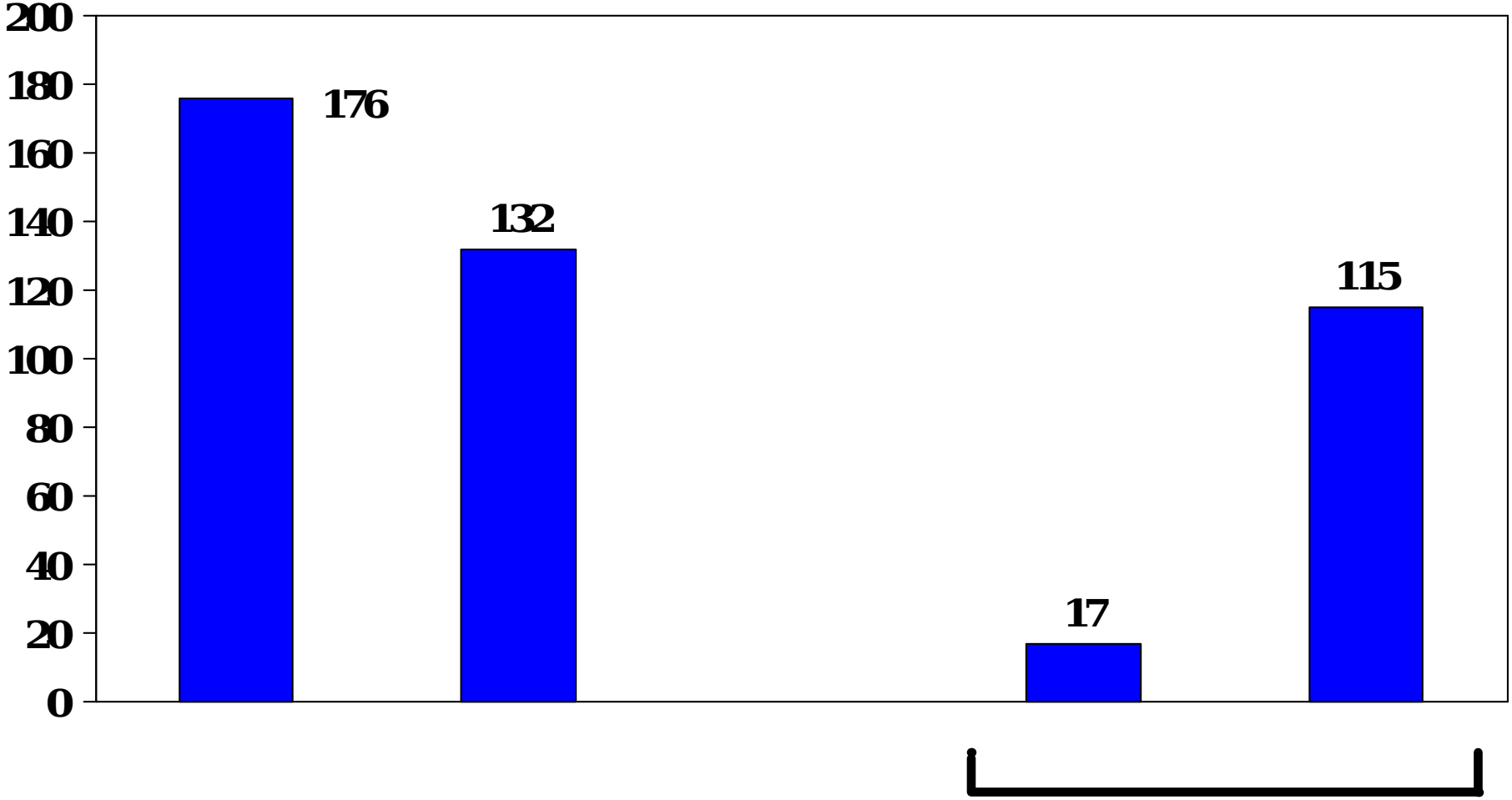
- Partnership Between DoD, DoT and U.S. Flag Sealift Industry
- Program Originally Targeted To DoD Sustainment Shipping -- MRS 05 Shows Program Also Provides Up To .5M Stons Surge Sealift Capability
- Contractual Arrangement For Obtaining Time-phased Access To Militarily-useful U.S. Flag Commercial Dry Cargo Sealift Capacity, Infrastructure and Intermodal Capability To Support DoD Contingency Requirements
- Contingency Demand Driven: Stage I - 15%, Stage II - 40%, Stage III - 50%
- To Receive Preference For DoD Peacetime Cargo Business, A Carrier Must Enroll 50% Of Its U.S. Capacity In VISA
- MSP Participa[nts] Provide "Sealift CRAF" Ships' Capacity

Maritime Security Program (MSP)

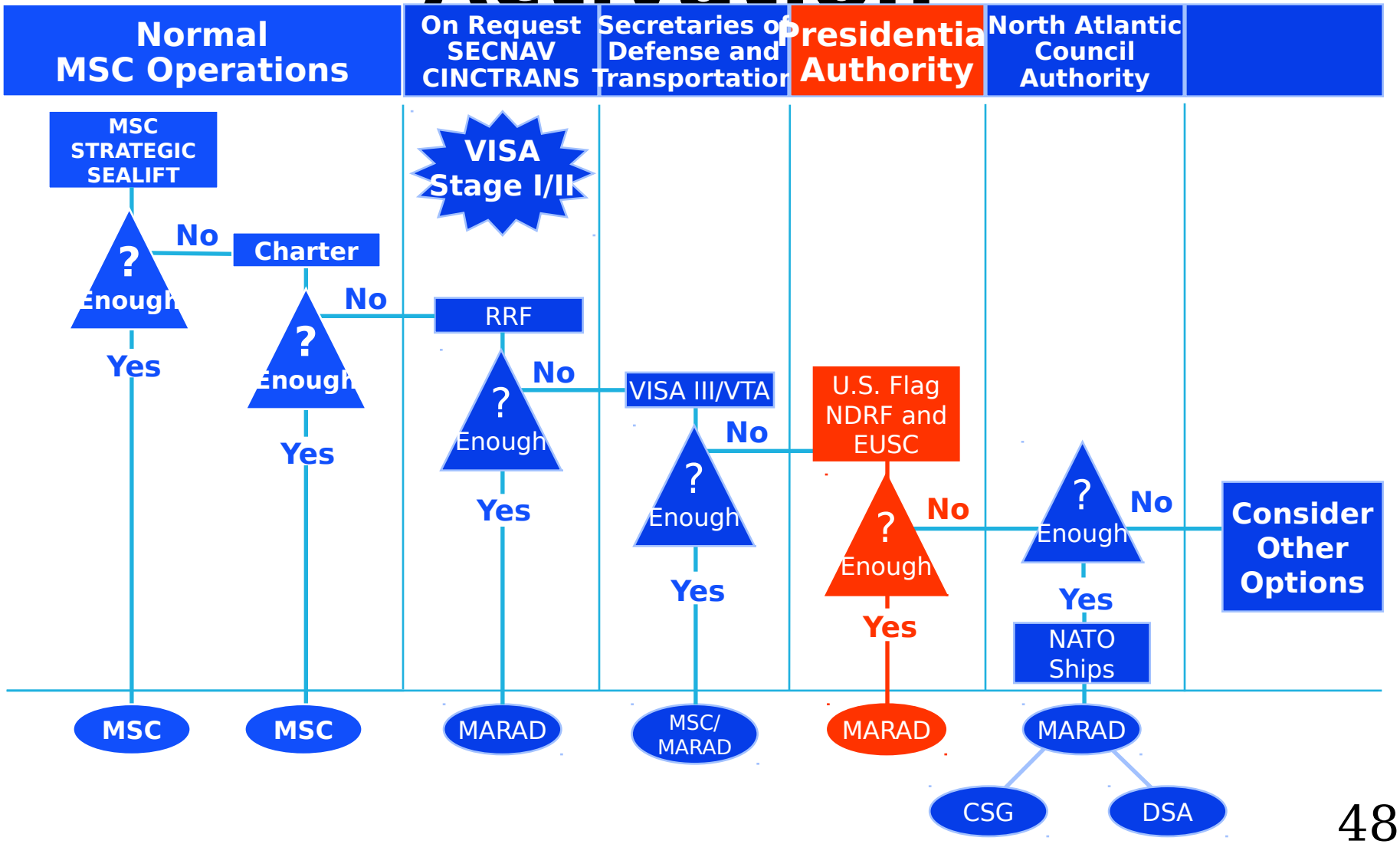
- Incentive Program To Increase DoD Access To Commercial Shipping and Strengthen Maritime Industrial Base
- 47 Ships Enrolled -- 38 Container, 1 LASH, 8 PCTC/Car Carriers
- Carriers Must Enroll In An Emergency Sealift Program Such As VISA.
- Carriers Receive $2.1M Annual Program Payment thru 2005
- Must Be U.S.-Flagged -- Can Be Foreign Built
- Reauthorized in 2003 for 60 ships, including 5 product carriers ($50 M/tanker), beginning FY06 ($2.6 – 3.1M) for 10 years

17 Ships Reflagged In Order To Participate In Program

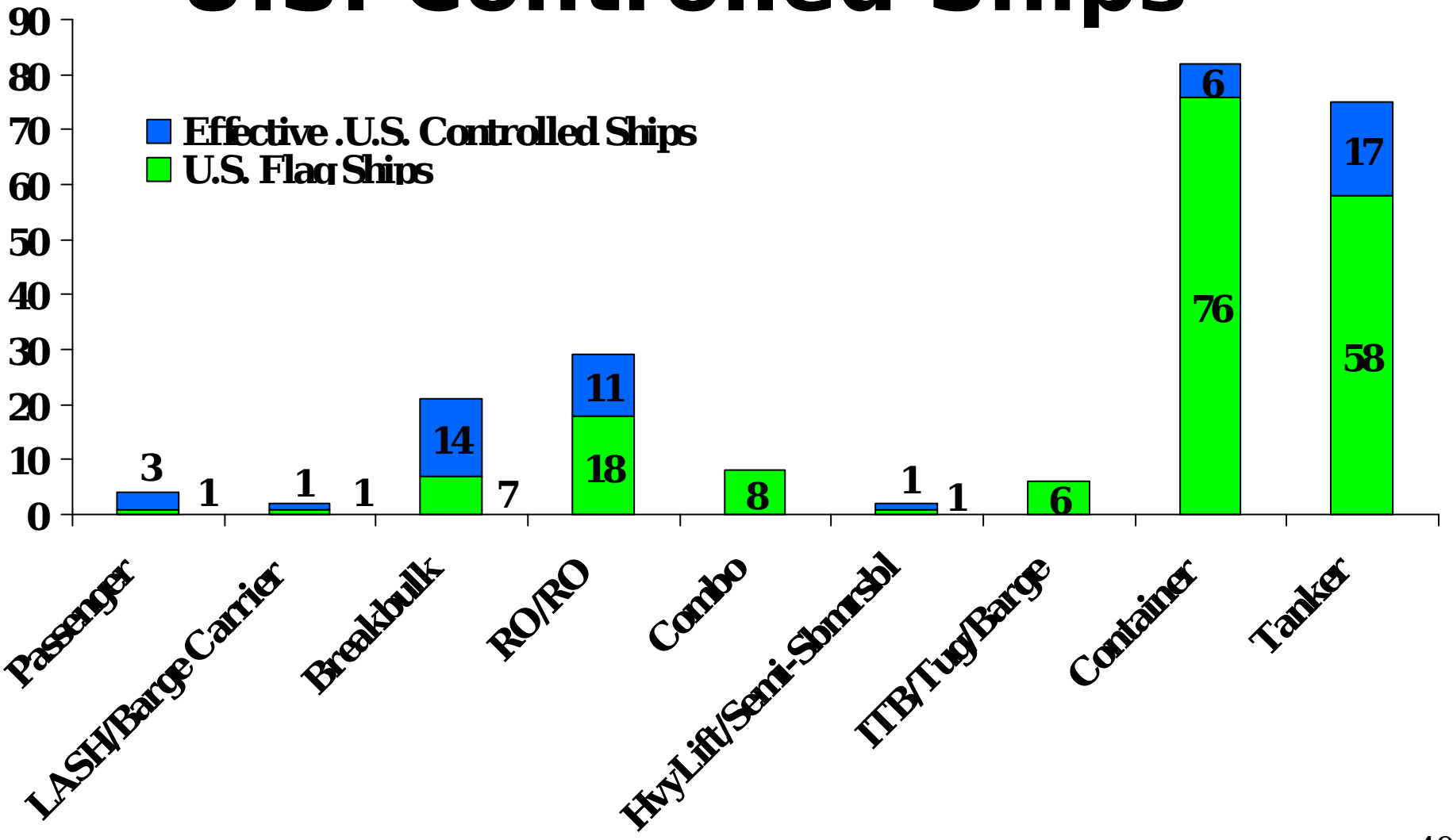
Militarily Useful vs SRP/VTA (US Flag)



Normal Sequence of Sealift Force Activation



Militarily Useful U.S. Flag and Effective U.S. Controlled Ships

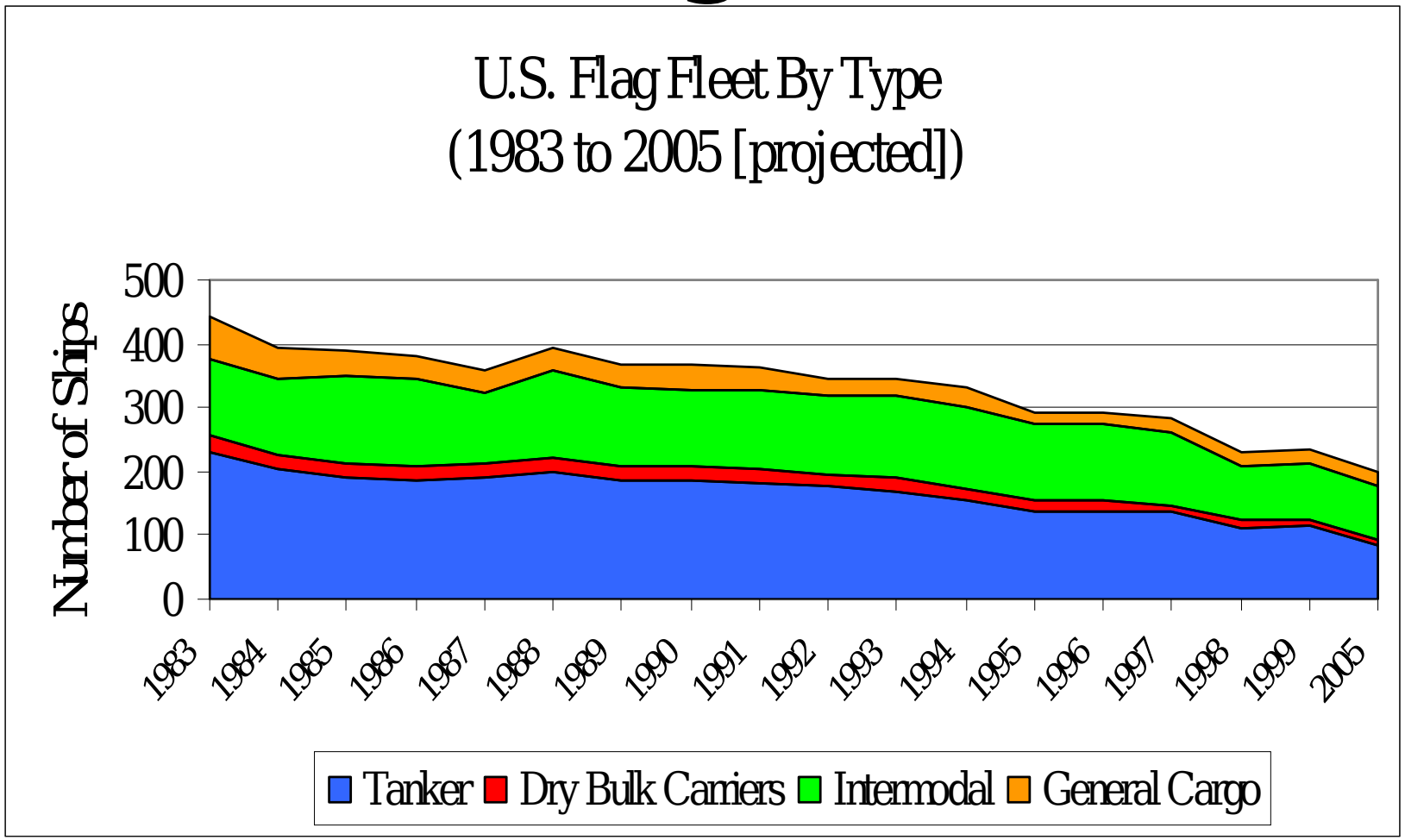


Decline of U.S. Commercial Sealift

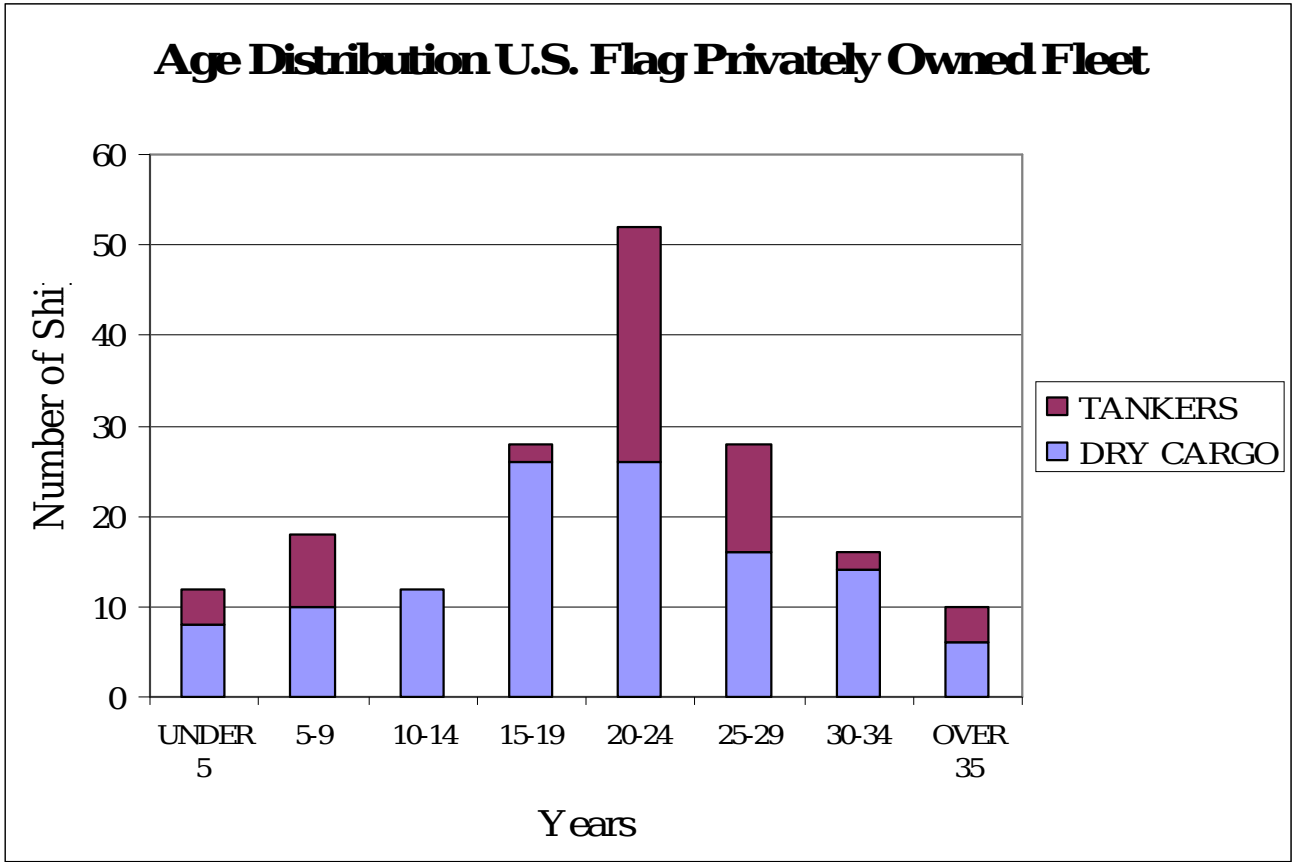
- **Foreign Trades**
  - U.S. Flagged Ships Not Competitive
    - Higher Crew And Operating Costs
    - Unattractive Tax Regime
  - Cargo Preference Trades Declining
    - Agricultural Programs Cyclical and Diminishing
    - Military Cargo Dominate
- **Domestic Trades**
  - Tanker Fleet Declining
    - Alaskan Oil Output Decline
    - Barges / Pipelines Used For Coastwise Movements
    - OPA 90
- **Dry Cargo Fleet Stable**
  - Serves Alaska, Hawaii, Puerto Rico and Guam

Fewer Ships Suitable For Surge

Commercial Sealift -- U.S. Flag Fleet



An Aging Fleet....



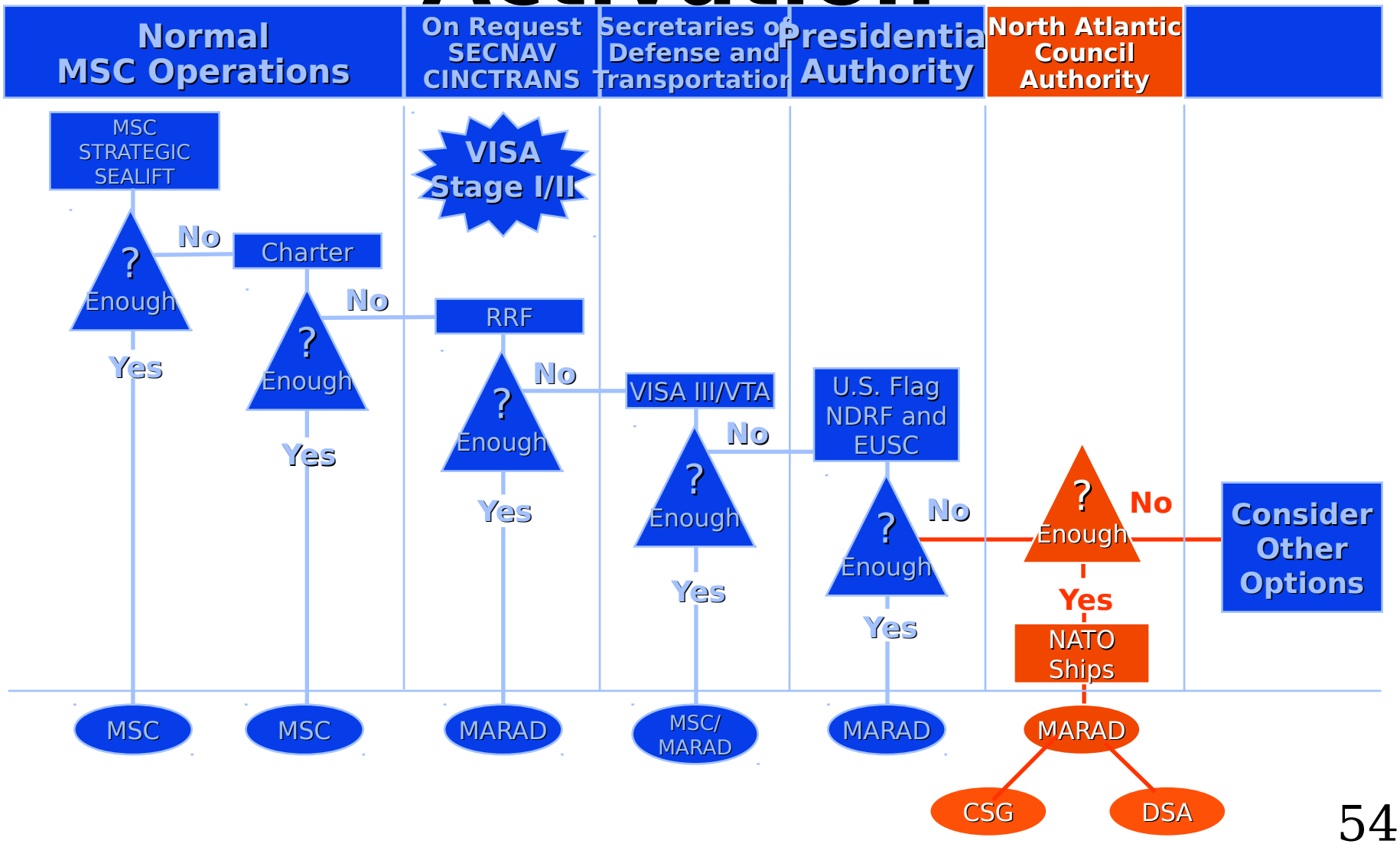
As 01 JUL 04

Government Controlled (MARAD) National Defense Reserve Fleet (NDRF)

- **Maintained at 3 Anchorage Sites**
  - James River, Va
  - Beaumont, Tx
  - Suisun Bay, Ca
- **Contains 68 Militarily Useful Ships**
  - 48 Breakbulk Ships
  - 11 Tankers
  - 9 Other Types

As of 30 Nov 03

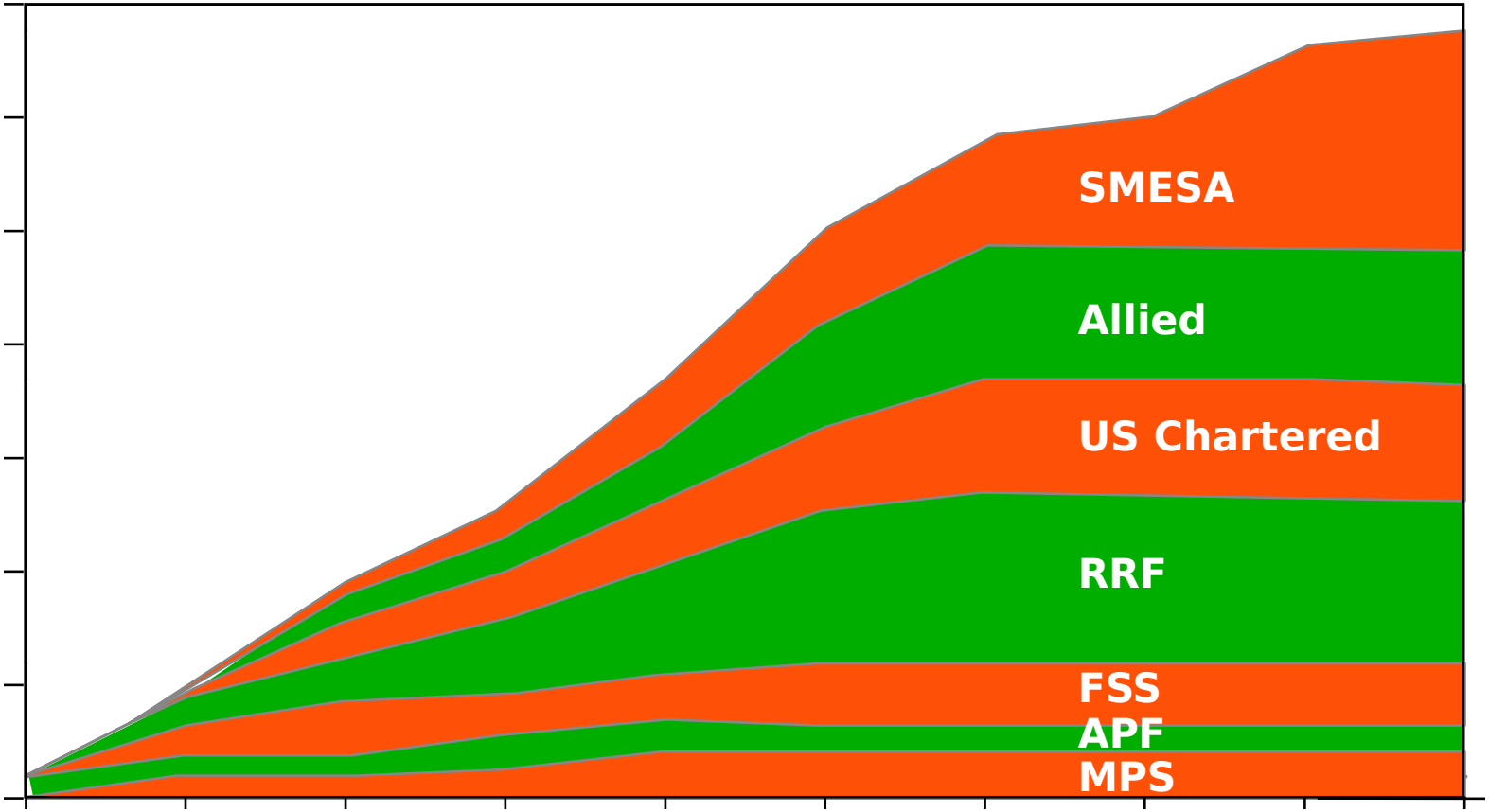
Normal Sequence of Sealift Force Activation



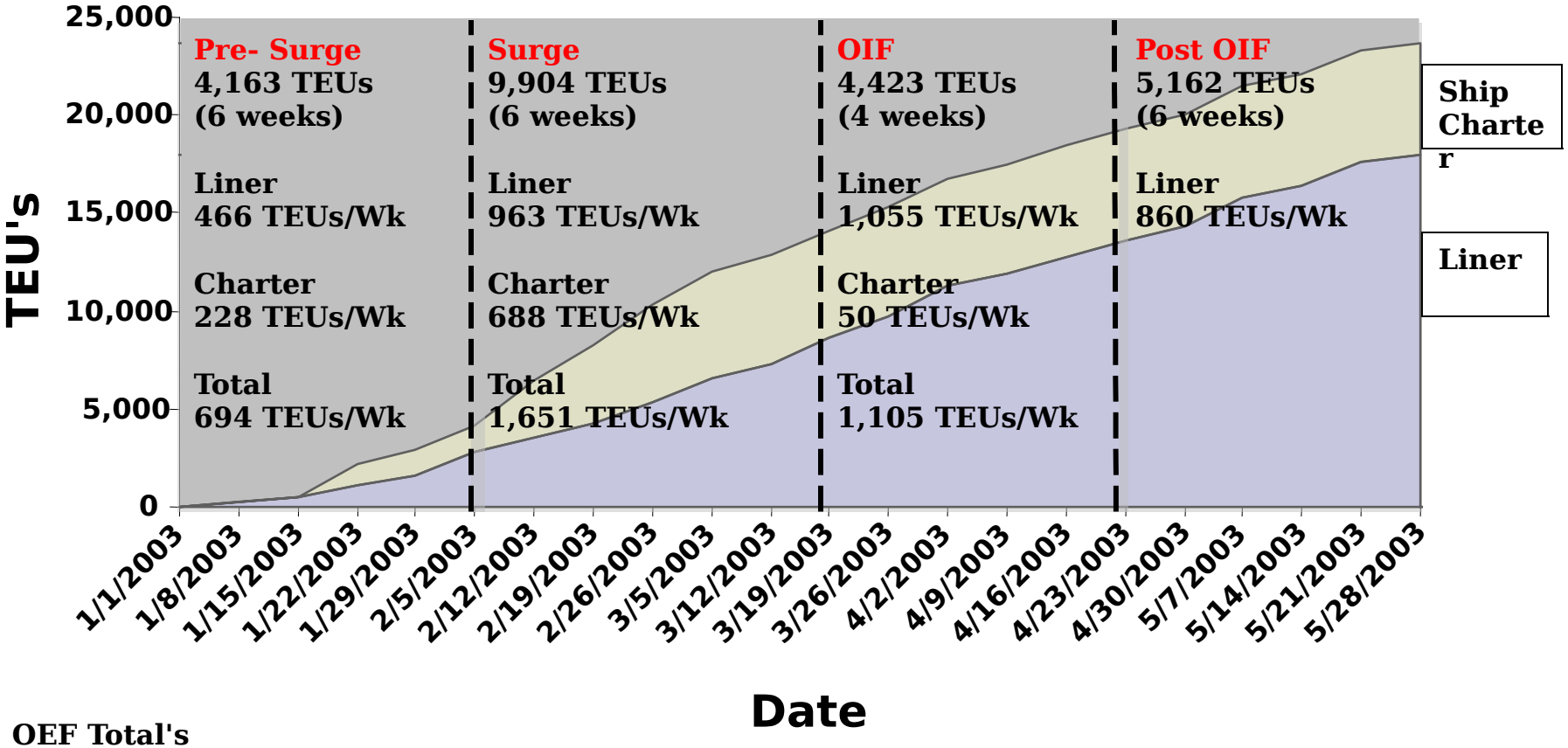
NATO Sealift Ships List

- Last Updated 12 Sept 1997
- Further updates held in abeyance
- 426 Ships Identified
  - **330 Dry Cargo Ships**
  - **14 Passenger**
  - **82 Tankers**

Desert Storm Sealift Dry Cargo Delivery Profile

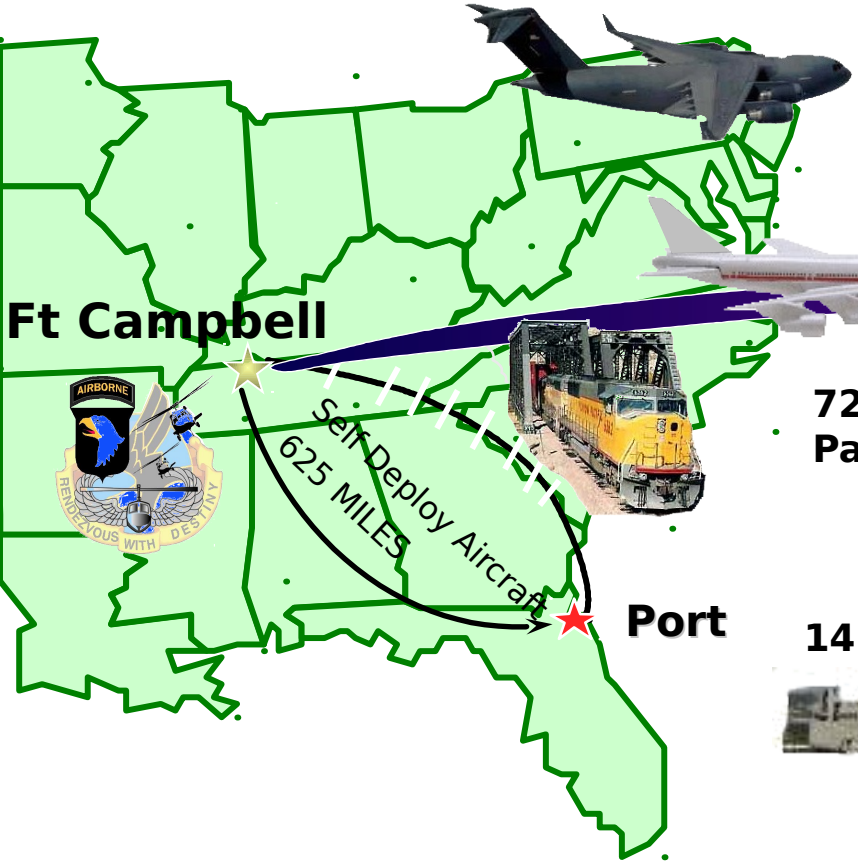


OEF TEUs Shipped from CONUS



OEF Total's
9,990 TEU's delivered prior to 1/1/03
30,261 TEU delivered from 9/11/01 until 6/1/03
5,500 TEU's delivered from prepositioned MPS
24,332 TEU's shipped from 1/1/03 to 6/1/03 from CONUS

Operation Iraqi Freedom
101st Airborne Deployment
Multi-modal Success



MILITARY AIR

4 Missions / 95 Stons

COMMERCIAL AIR

72 Missions / Over 19,000 Pax

STRATEGIC SEALIFT

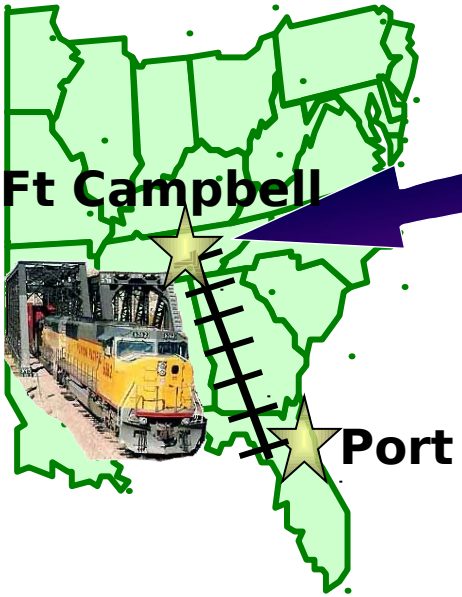
14 Vessels / 70,000 Stons

Plan Start	Plan Validated	Ship Loads	Ship Underway	Troops Move	Troops Close	Ships Arrive	Last Ship Underway	Deployment Complete
3 FEB	6 FEB	11 FEB	15 FEB	25 FEB	3 MAR	7 MAR	4 APR	24 APR

Operation Iraqi Freedom
101st Airborne Redeployment
Multi-modal Success

MILITARY AIR

49 Missions / 372 Stons

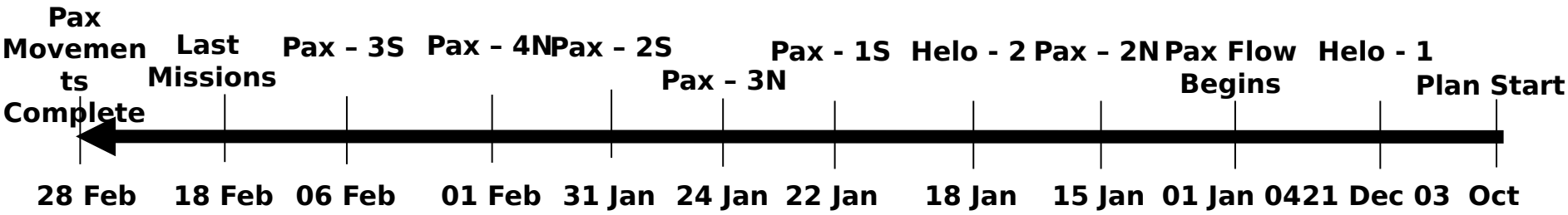


COMMERCIAL AIR

61 Missions / Over 15,300 Pax

STRATEGIC SEALIFT

7 Vessels / 35,000 Stons



Operation Iraqi Freedom
101st ABN (AASLT) Deployment

FT CAMPBELL

JACKSONVILLE

Each Ship Loaded by Task Organization to Provide Immediate Combat Force

Deployed Combat Power Faster – Over Ocean Time Reduced by 15%

New Ft Campbell Railhead 33 Trains vice 0 for DS/DS

Used 50% Fewer Ships Than DS/DS

Task Force Loading Improved Combat Capability

Operation Iraqi Freedom Ammunition Shipments

Containerized

Zero break bulk vessels vice 33 break bulk vessels for DS/DS

MOTSU

TURKEY

KUWAIT

75% Decrease in Load Time

5000 20’ Ammo Containers Loaded

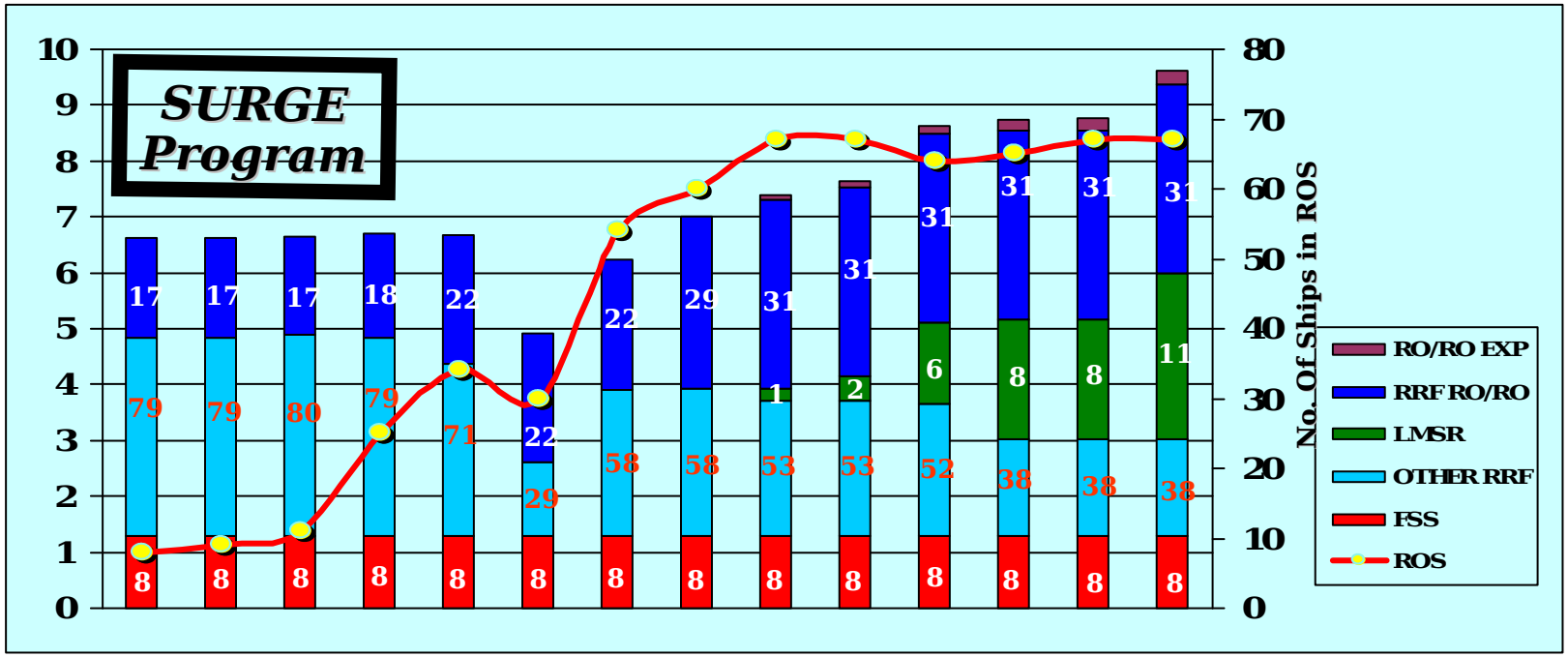
Overall Ocean Transit Reduced by 15%

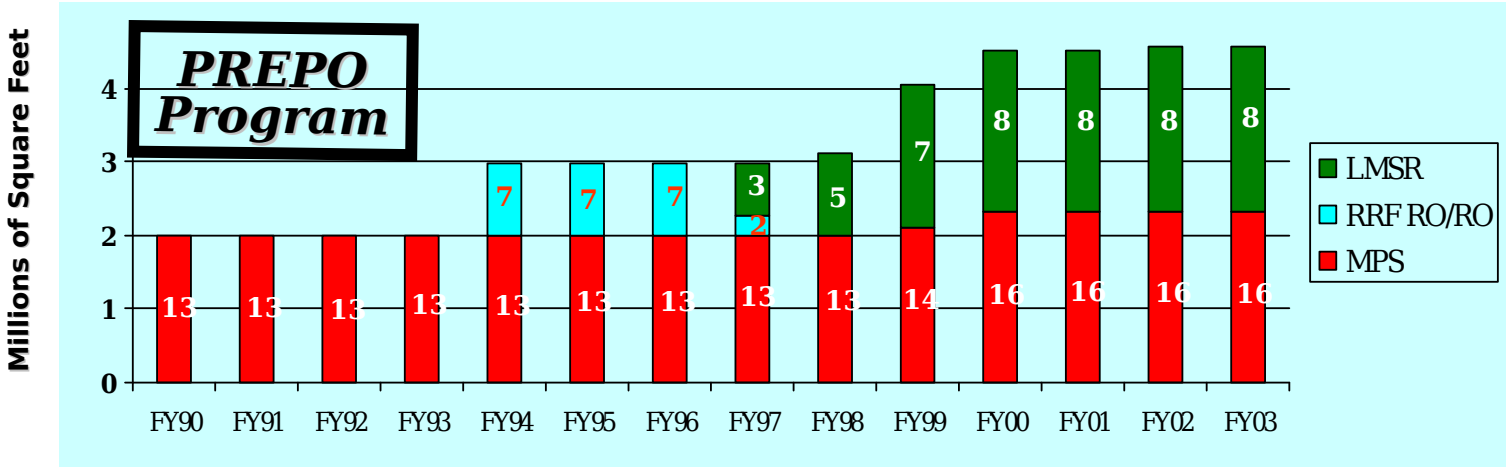
ntainerized Ammo Shipments: A Lesson Learned From DS/

STRATEGIC SEALIFT PROGRAMS

SURGE & AFLOAT PRE-POSITIONING

Sized to Meet the Strategic Sealift Requirements for 1 MTW
Can Lift the Army Objective Force of 4 Divisions in 30 Days



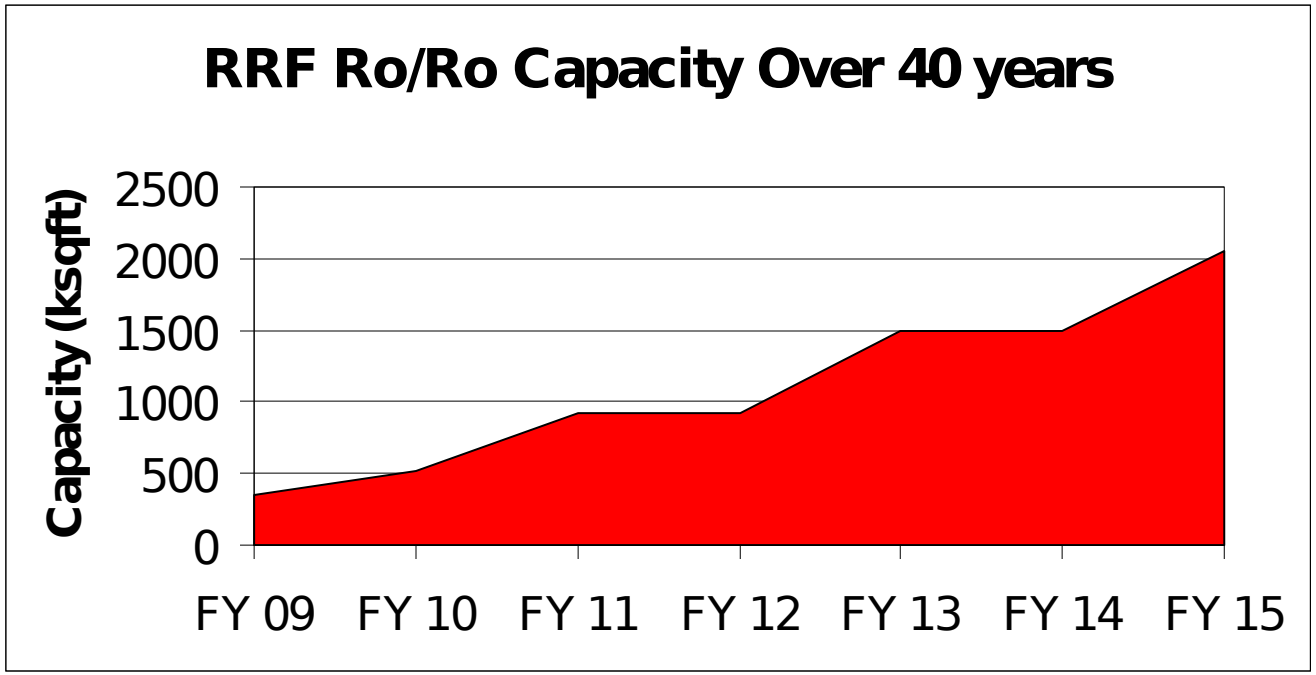


Sealift Challenges 2005 - 2015

- **Economically Recapitalize Organic Sealift Fleet (RRF/FSS)**
  - MPF Buyout To Recapitalize RRF RoRo Capacity
  - Exploit High Speed Sealift Technology To Replace FSS
- **Maintain Commercial Capability To Support MCO And SSC Sustainment Shipping**
  - Reauthorize Improved MSP In FY 2005
- **Increase Reliance On Commercial Sealift Industry To Satisfy Surge Sealift Requirement**
  - National Defense Features (NDF) To Replace Lower Readiness Ships
  - Increase Use Of Container Shipping

Challenge: Recapitalize Organic Fleet

RRF Aging



Challenge: Recapitalize Organic Fleet MPF Buyout To Replace RRF Capacity

- **Three Squadrons Comprising 13 Leased Ships**
  - Provides 1.8M sqft Plus 6,551 TEU
  - Leases Expire 2009 - 2011
- **Three More Gov't Owned Ships Added**
  - Adds .5M sqft + 2,700 TEU
- **Purchase Of 13 Leased Ships Permits 5 - 10 Year Phased Replacement By MPF (Future)**
- **Retired MPS & MPS(E) Ships Fully Recapitalizes RRF Through 2015**
- **Cost Effective To Buy As Soon As Possible Even Without RRF Recapitalization**
- **MPF Ships Will Provide 15 - 20 Years of Service After 2011**

Buyout Programmed For FY06

Challenge: Recapitalize Organic Fleet Replace FSS With High Speed Sealift (HSS)

- **FSS Reach Age 40 ≅ 2012**
- **Army leadership desires 70+ Knot Shallow Draft/High Speed Sealift (SD/HSS) for Objective Force transport.**
- **FastShip 38 knot design available for near term production**
- **OPNAV/DCSLOG/NAVSEA/TRANSCOM Working Group Developed Technology Development Plan (MARAD, ONR, DARPA Participating)**
- **Navy LCS award could lead to intermediate scale trimaran and semi-planing monohull designs**
- **Advanced Mobility Concept Study Investigated**
  - 75 KT SD/HSS
  - 60 KT Navy Vision SES
  - 55 KT Navy Vision Trimaran
- **Defense Science Board Strategy Mobility Task Force**
  - Reviewing alternate mobility technologies
  - Considers 43 kt, 10K ST, 5000 nm technically feasible

Industry

Containerization Of Unit Equipment -- MRS 05

- Use of VISA Container Ship Capacity To Move . 5M Stons Of Unit Equipment.
- Examined CS/CSS Units 100% Containerizable
  -- Fit In a Container

Improved Force Closure By Weeks

No Army/AF Breakbulk in OIF!

Challenge: Maintain Commercial Capability

Reshaped MSP

- **MSP Expires 2005**
- **New Program Authorized for 10 years beginning 2005**
- **Escalating annual payments from $2.6M To $3.1M over the life of the program**
- **Ship level increased from 47 to 60 including 5 product tankers (which can receive up to $50M/ship for construction)**
- **DoD preferences, based on vessel type:**
  - Product Tankers
  - RO/RO – PCTC
  - Heavylift (FLO/FLO and LO/LO)
  - LASH
  - Containers (at least 1500 TEU)

Challenger Increase Reliance on Industry

National Defense Features (NDF) Concept

- Privately Owned And Operated Merchant Ships
- Crewed By U. S. Merchant Seamen
- Built In U.S. Shipyards
- Built With Navy Funded NDFs For Military Cargo
- Recallable For Military Contingencies

"Active RRF"

National Defense Features

- **Examples of National Defense Features:**
  - Deck Strengthening And Hoistable Decks For Pure Car/Truck Carriers
  - Self-Sustaining Features Such As Cranes or Provisions for Their Rapid Installation on Container Ships
  - Increased Speed
  - Convertible Container / RO/RO Cargo Holds

Challenge: Increase Reliance on Industry

NDF Military Benefits

- **Could Be Used To Deploy Follow-On Unit Equipment And Sustainment**
- **Potential Partial Offset To Surge And Sustainment Shipping Requirements**
  - Depends On Ship Speed And Availability
  - Alternate To RRF Recapitalization (RRF-10)
- **Creates Pool of Ships Available To Respond To Crisis**
- **Increases Pool Of U.S. Merchant Mariners To Crew Sealift Ships**

NDF Program Issues

- **Current NDF Program Unattractive**
  - Limited To Funding Features, Installation, Maintenance, And Operational Penalties
  - NDF Insufficient Incentive To Offset Increased Costs Of Building Ships In U.S. Shipyards except for Jones Act trades
- **Restructure NDF Program To Attract Participants**
  - Allow Shipping Companies To Receive Advance Payments For Future NDF Operating And Support Costs
  - Expand Program To Compensate For Higher Capital Construction Costs

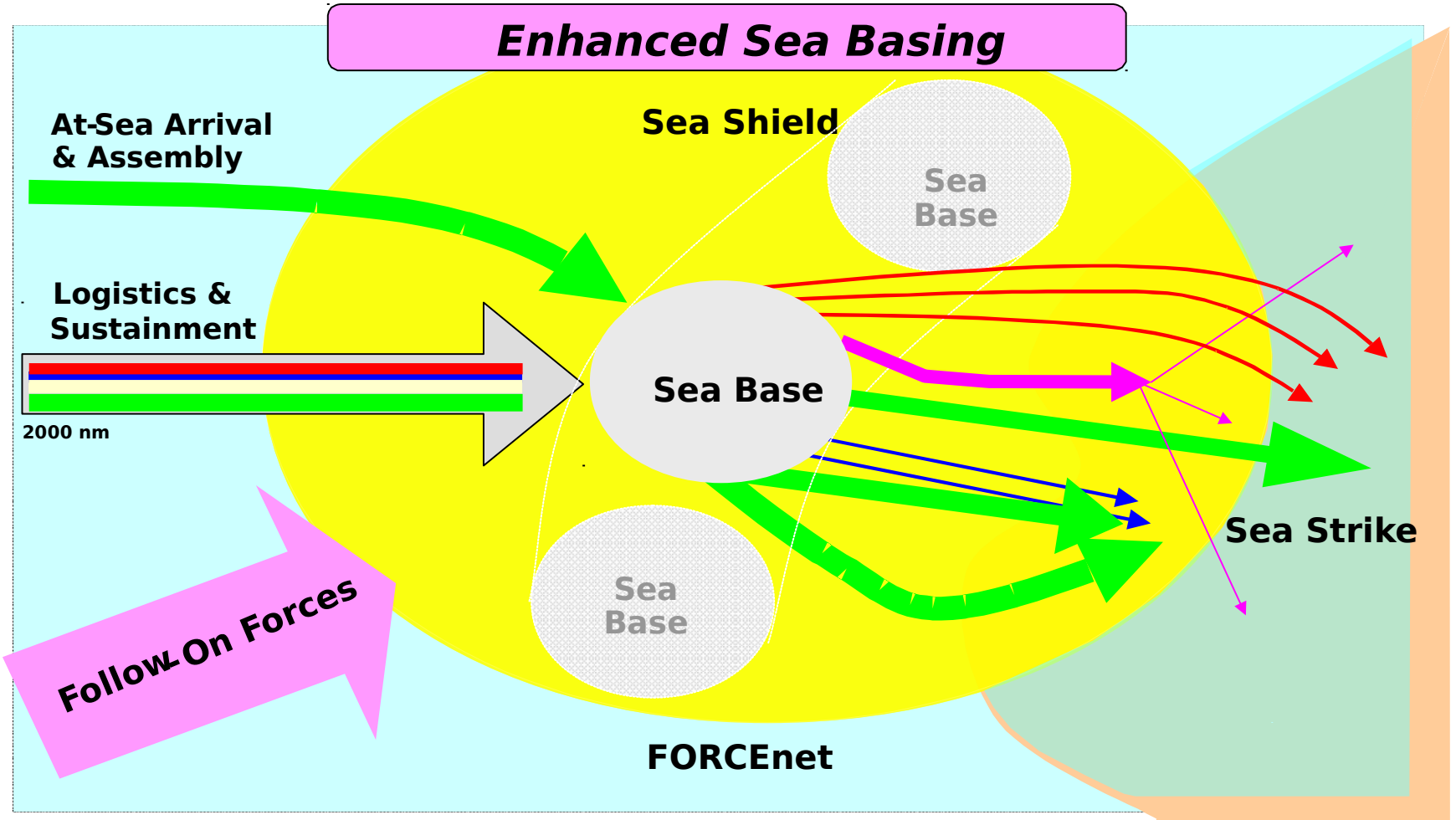
    (e.g. MSP tanker construction subsidy)

FUTURE STRATEGIC SEALIFT 2010 & BEYOND

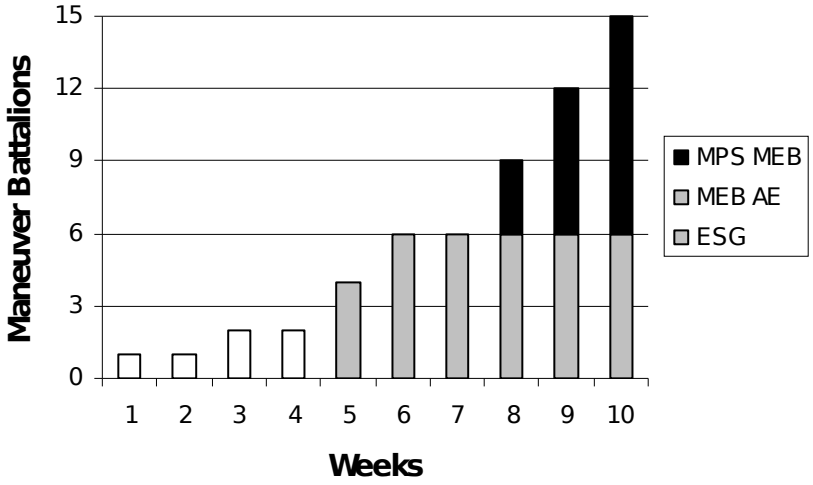
MPF Future and Beyond

- **In Support Of Naval Concept Paper - Applying Principles of OMFTS and STOM**
- **Support Seabased RSO&I and Logistics**
  - Eliminates Need For Host-Nation Facility
  - Accommodations For Embarked MPF MAGTF Forces
  - Assembly And Staging Facilities
  - Facilities For Sea-Based C2 Of MPF MAGTF Ops.
  - Provide Indefinite Sustainment For Forces Ashore
  - In-Theater Reconstitution and Redeployment
- **Type And Number Of Ships - TBD**

Sea Basing

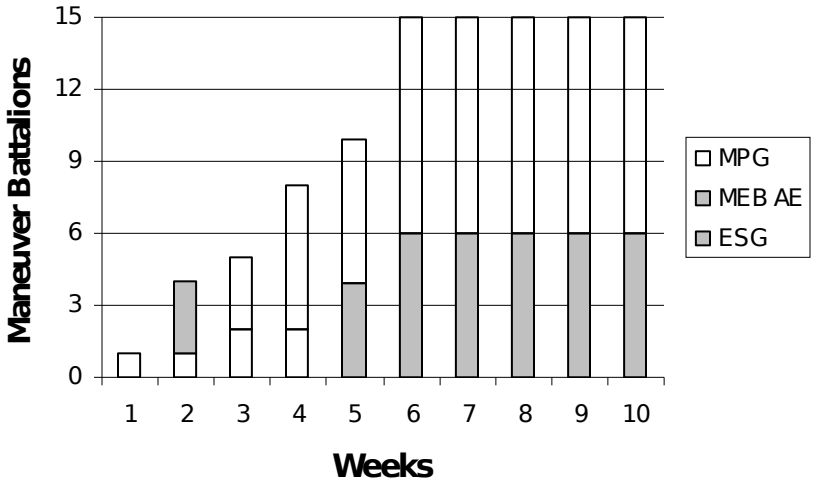

Enhanced Sea Basing
At-Sea Arrival & Assembly
Sea Shield
Sea Base
Logistics & Sustainment
2000 nm
Sea Base
Sea Strike
Sea Base
Follow-On Forces
FORCEnet

EXW Force Closure



Current CONOPs

- 3 ARG/MEUs deployed (1 from each coast and 1 in Japan). 3 MPSRONs pre-positioned.
- CVBG & 2 ARG/MEUs provide limited forcible entry capability w/in 3 weeks in 1 region.
- 1.0 MEB AE (incl. deployed ARG/MEUs) available from both LANT & PAC w/in 4-6 weeks.
- Following forcible entry, 3 MPSRONS offload and MEBs assemble ashore with



Future CONOPs (Notional)

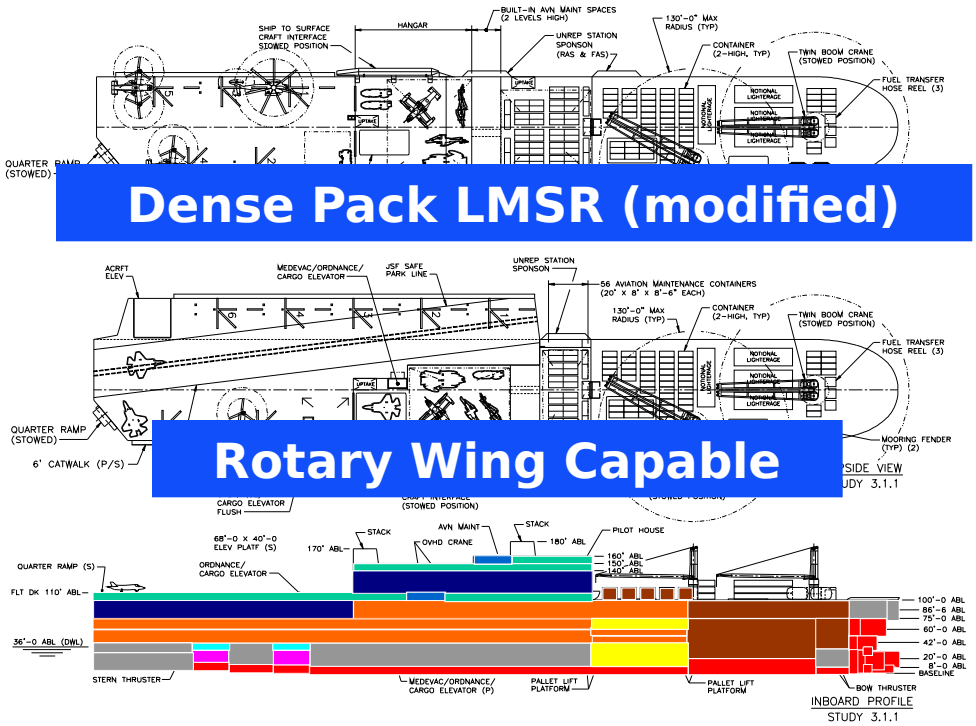
- 3 ESGs deployed (1 from each coast and 1 in Japan). 3 MPSRONS(F) pre-positioned.
- ESF (CSG/ESG/MPG) within 1-2 weeks.
- 1 MEB AE (including deployed ARG/MEUs) available from both LANT & PAC w/in 4-6 weeks.
- Maximum of 2.0 MEB AE and 3.0 MPF(F) MEB sea based (15 battalions total).

AoA MPF (F) Design Study

- **Step One: MPF(F) MEB support**
  - What must the platforms carry (T/E and Sustainment)?
  - Designs allow sea basing
  - Retain flexibility for Joint forces and new technology
- **Step two: Sea base connectors**
  - Air and surface craft interface
  - Organic surface craft requirements
  - Heavy cargo interface
- **Step three: Additional capability modules**
  - T-AH, T-AVB, JCC(X), MCS, AFSB, ESS

AoA Completed MAY 04

AoA Conceptual Ship Designs



Accommodations: None
RO/RO square: 184 K
ISO containers: 784
Cargo fuel:1.3 M gal

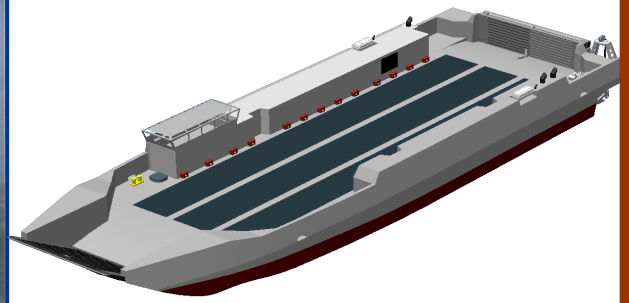
Accommodations: 2092
RO/RO square:235 K
ISO containers:628

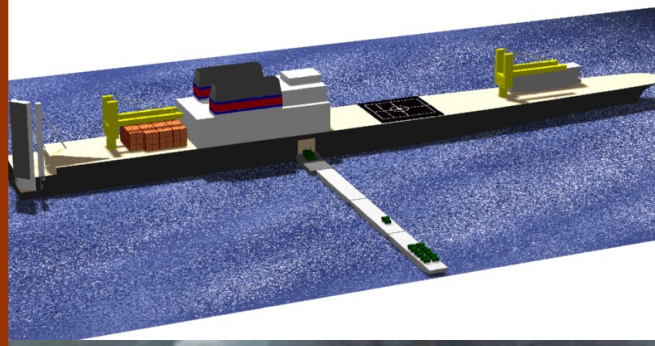
Ship Characteristics:

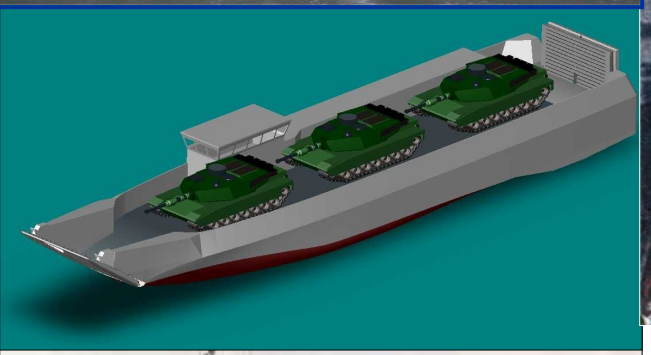
Length overall: 949 - 1,0363 ft
Beam (waterline): 106 - 141 ft
Beam (flight deck): 106- 194 ft
Draft (full load): 35 ft
Displacement (full load): 60,000 – 90,000 LT

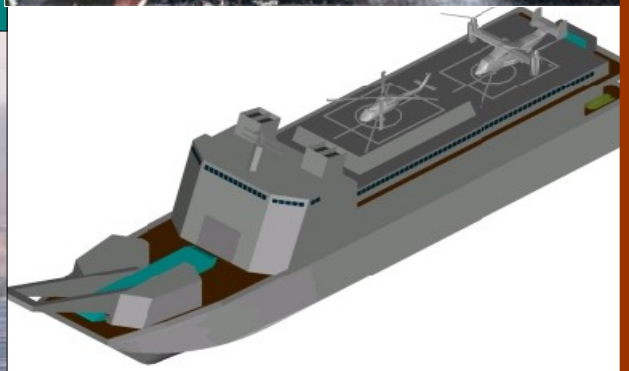
- ACCOMMODATIONS/SUPPORT SPACES
- HANGAR & AIRCRAFT MAINTENANCE
- VEHICLE STOWAGE & MAINTENANCE
- CONTAINER STOWAGE & CARGO STAGING AREA
- PALLET & ORDNANCE STOWAGE
- JP-5 STOWAGE
- MACHINERY & AUXILIARY SPACES
- MISSION SUPPORT SPACES (C4I & HOSPITAL)
- SHIPS FUEL & BALLAST TANKS
- POTABLE WATER STOWAGE

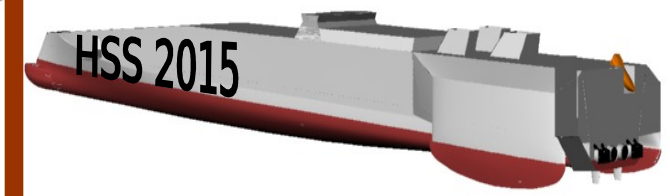
Possible Surface Connectors











Possible Air Connectors

High Speed Sealift - The Challenges

Why Speed is Important?

"Git Thar First With The Most"
General Nathan Bedford Forrest

- **Increase speed from 24Kts to 55Kts**
  - Transit time saved from Galveston, TX, to Kuwait.
    - From 17 days 5 hours / To 7 days 12 hours

But: Inter-Theater Sealift process of many steps

- **Cargo vs. Ship: Transit Time to Port**
  - Presumes equipment/cargo arrives before ship
- **Port Loading/Unloading**
  - Number Berths/Size/Depth limit throughput
- **Canal & Choke-point Transit**
  - Possible escort requirement
- **Reception, Staging, Onward Movement and Integration (RSO&I)**

Ocean Transit Speed is Just one part of Origin to Destination Timeline

Inter-Theater Planning Factors

FSS/LMSR: Galveston to Kuwait

Fixed Factors

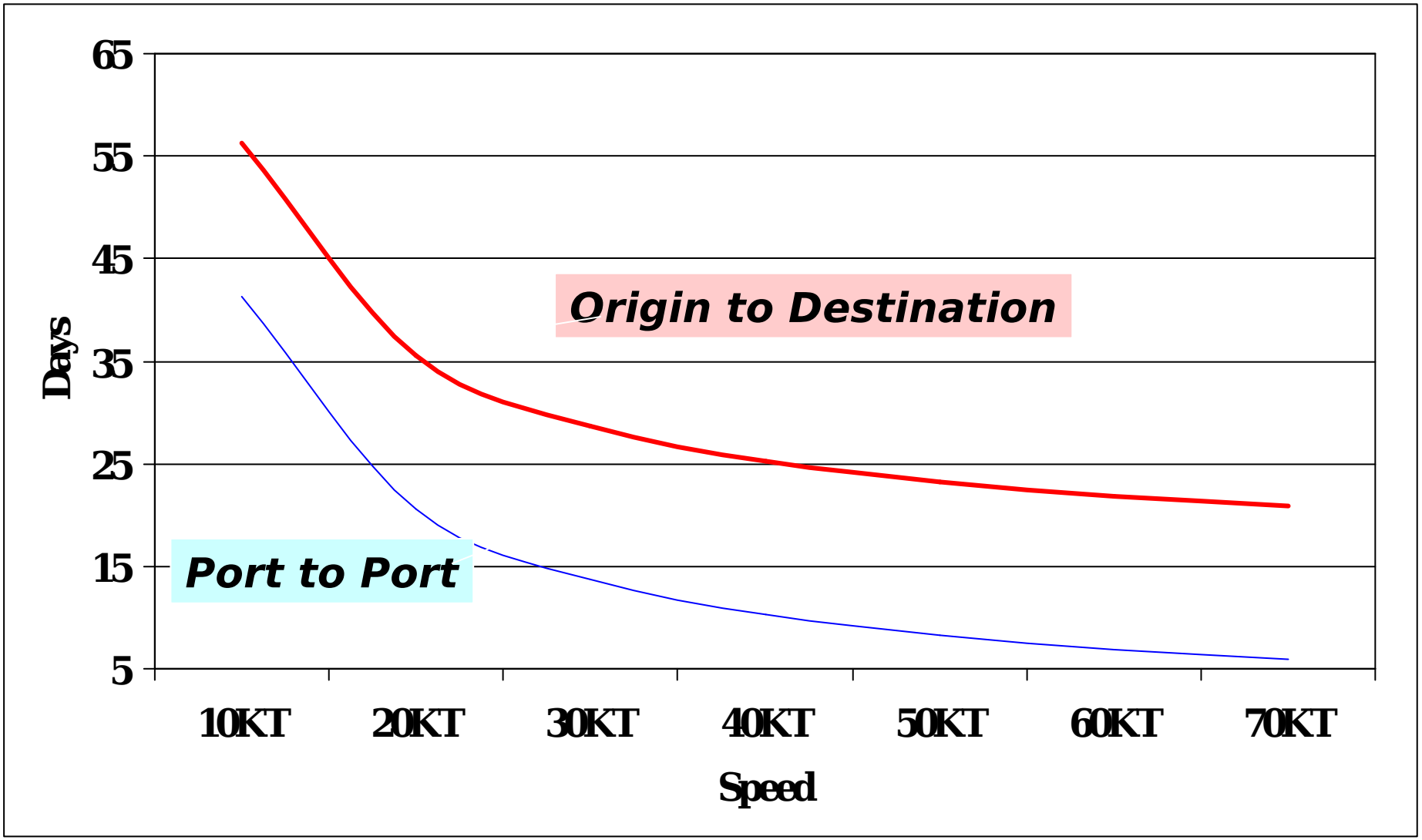
- **Distance = 9,903 NM**
- **Ship to Port = 4/5 days**
- **Ship Load = 2/3 days**
- **Offload = 2 days**
- **Canal Transit = 2 days**
- **RSOI = 4 days**
- **Fixed Total = 14/16 days**

Speed Variable

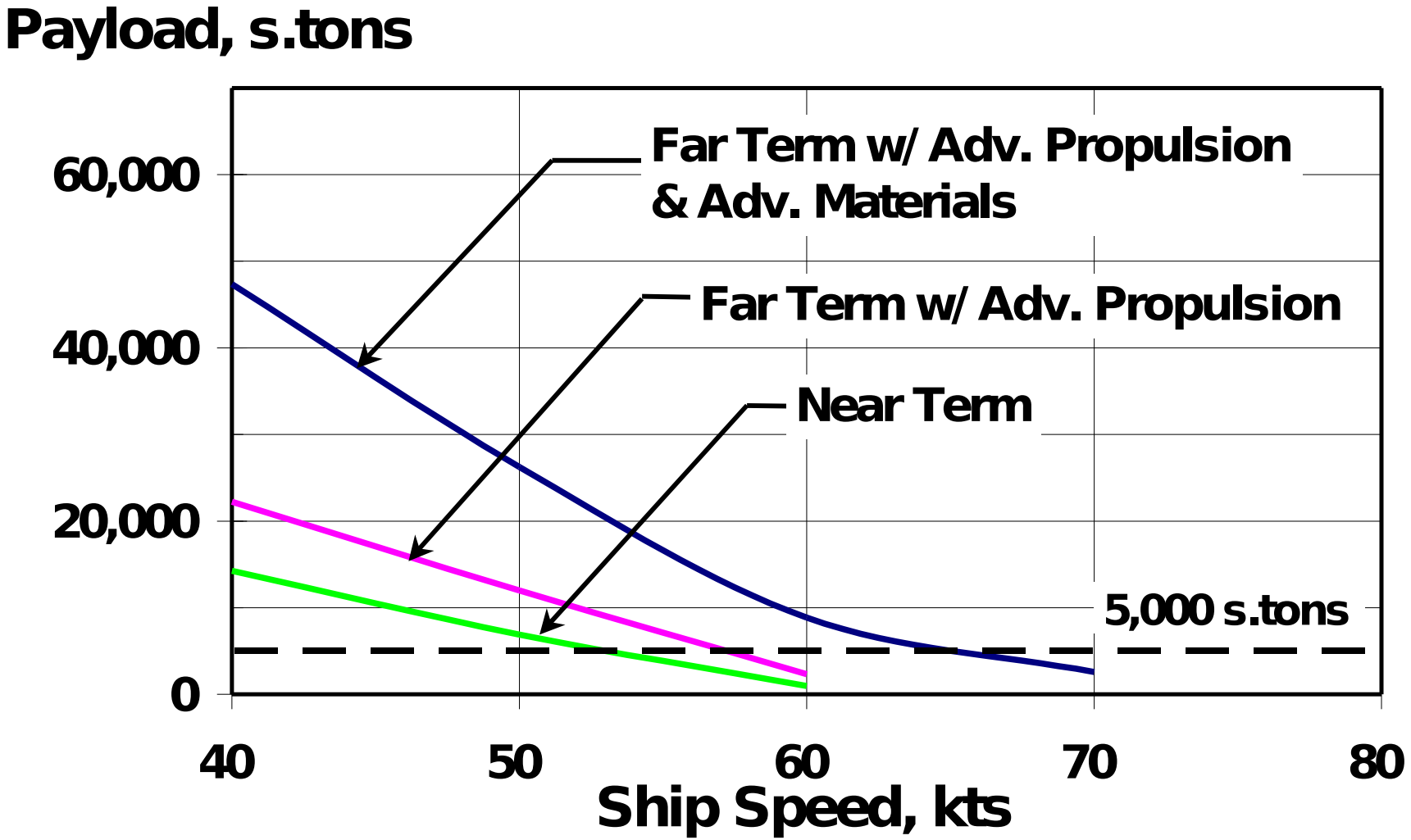
- **LMSR = 24 KTs**
  - **32 days/5 hours**
- **FSS = 30 KTs**
  - **28 days/18 hours**
- **FSA = 36 KTs**
  - **26 days/9 hours**
- **SDHSS = 55 KTs**
  - **22 days/12 hours**

SDHSS with 2.3 x LMSR Speed Reduces Origin/Destination Time by 29%.

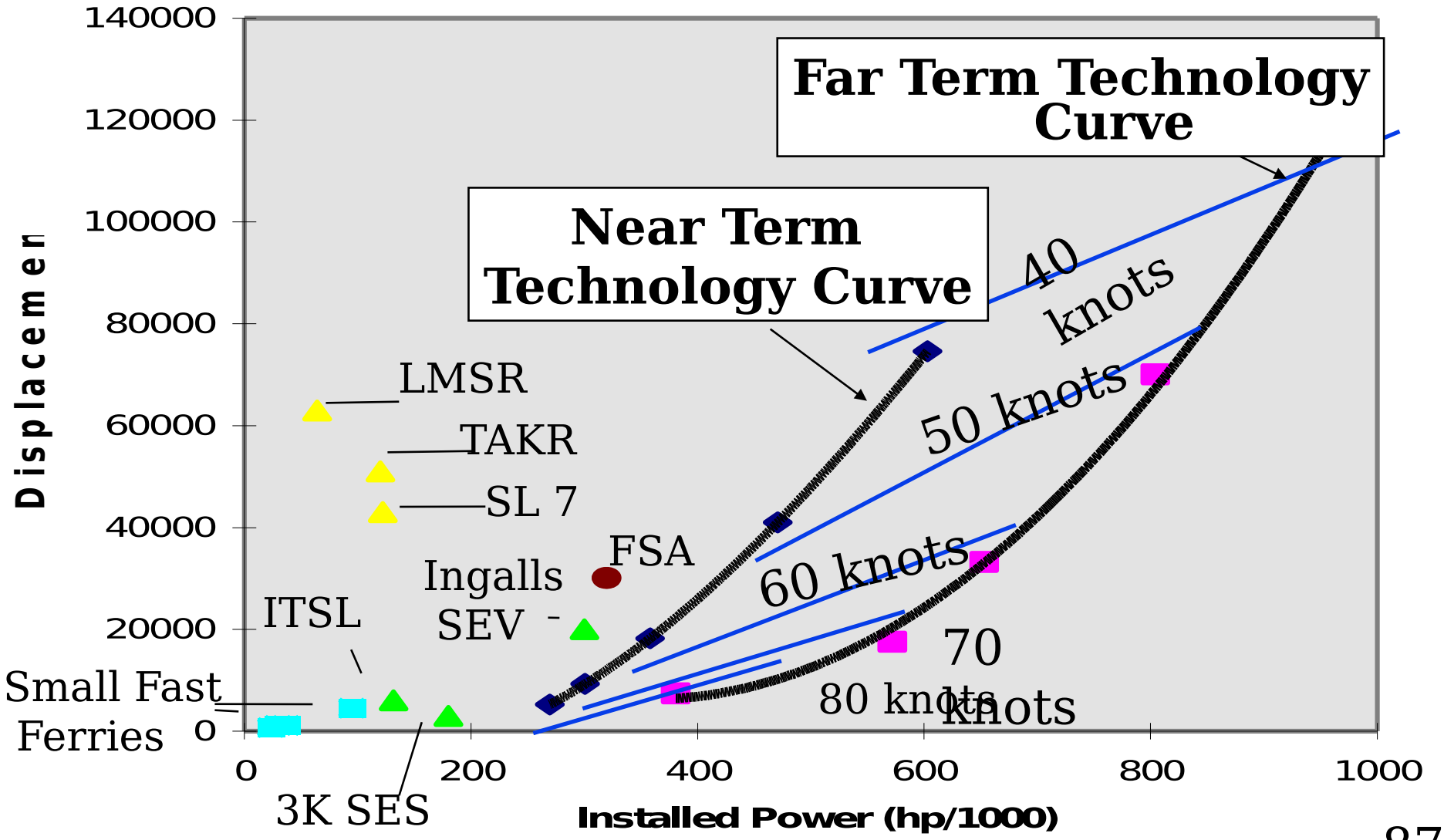
Origin/Destination & Port-to-Port Time



Payload Versus Speed for Range = 9,000 nm



Ship Size/Power Implication



Summary

- **Significant High Speed Transport Capability Exists in the Near Term BUT Some Solutions May Be Physically Possible But Not Cost Effective**
- **Technology Leads to Greatly Expanded Transport Capability in Far Term**
  - Performance Impact of Structure/Material & Propulsion Technologies is Dependent Upon Speed Regime & Desired Endurance
  - Further Engineering Development Work Is Required to Extrapolate Performance of Ancillary Systems

HSS Technology Development Plan

Year	1	2	3	4	5	6	7	8	9	10	Funding ($K)
Hull Form											
- Monohull											5,800
- Trimaran											7,200
- Surface Effect Ship											2,100
Waterjets											27,350
Hull/Propulsor Integration											5,900
Structures & Materials											256,050
Gas Turbines											910,500
Reduction Gears											26,000
Lift Fans											6,300
Seals											7,000
Funding ($K)											1,254,200

Near Term
Far Term

Large Scale Validation/ Demonstrations

- laboratory test articles
- demonstrator vehicles
- commercial ships of opportunity
- technology insertions in acquisitions

High Speed Sealift Technology Plan developed by Carderock Division Naval Surface Warfare Center

Advanced Mobility Concepts Study

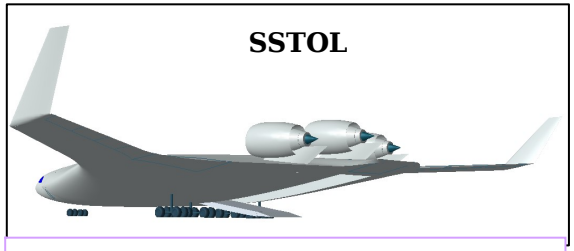
Theater Support Vessel

Speed - 40 KT
Range – 1,700 NM
Payload – 1,250 ST
30,000 SQ FT
350 PAX

High Speed Monohull

Speed - 38 KT
Range - 6,000 NM
Payload - 8,000 ST
158,000 SQ FT

SSTOL



Speed - 489 KT
Range – 3,863 –10,841 NM
Avg Payload - 149 ST
500 PAX

Ultra Large Airship

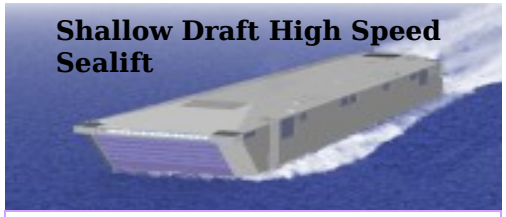
Speed - 76 KT
Range – 5,607-10,000 NM
Avg Payload - 238 ST

Mobile Offshore Base

Speed - 12 KT transit
5 KT connected
Avg Payload – 5 M SQ FT

15,000 PAX
2.5 M SQ FT Flight Deck
5,000 FT Runway

Shallow Draft High Speed Sealift



Speed -75 KT
Range – 7,000 NM
Avg Payload – 4,400 ST
86,489 SQ FT
1,000 PAX

Global Range Transport

Speed - 380 KT
Range – 3,100 - 4,700 NM
Avg Payload - 30 ST
20 PAX

AMCS Insights

- **Shallow Draft technology should be pursued.**
  - Number one concept in Phase 1 and 2.
  - Closes the gap between airlift/sealift.
  - Reduces dependency on deep-draft ports and allow mulitiple entry points
- **TSV provides high value for intra-theater movement, especially in anti-access area-denial environment.**
- **Fast deep-draft vessels also provide benefit when infrastructure available.**
- **Additional study of world-wide seaports would better define capability of vessel concepts.**

AMCS Recommendations

- OSD consider follow-on technical readiness, cost, and port analyses to include appropriate direction in POM DPG-06 to initiate Research Development Testing & Evaluation (RDT&E) on Shallow Draft High Speed Vessel, Theater Support Vessel, Super Short Take-Off and Landing aircraft, Global Range Transport, and Joint Rapid Airfield Construction.
- Conduct an excursion to the next Mobility Requirements Study that considers transformed forces and mixes of advanced and current lift in the 2020 timeframe.

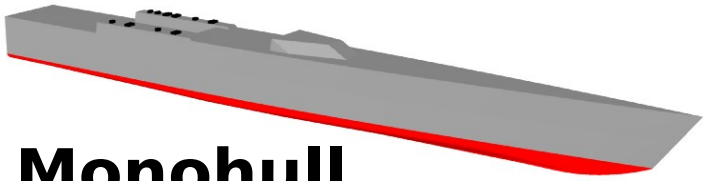
NAVSEA Comparative Concept Study of Alternative Hull Forms for a High Speed Sealift Role

Study Objective: Concept level descriptions of Monohull, Catamaran, and Trimaran ships with the following capabilities:

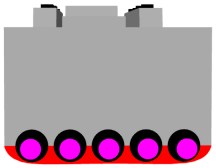
- Cargo Capacity:
  - 200,000 sq ft gross, 150,000 net RORO cargo stowage area;
  - 10,000 short tons
- Maximum speed goal of 45 knots
- Un-Refueled Range of 5,000 nautical miles
- Arrival draft of 25 feet or less
- Assumed technologies available for IOC 2015
- Suez Canal constraint limits beam to 197 feet

"EQUAL CAPABILITY" COMPARISON YIELDS DIFFERENT SHIP CHARACTERISTICS – Length, Beam, Draft, Etc.

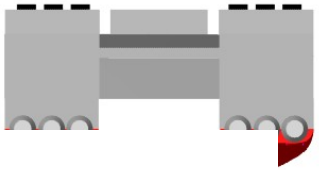
Comparison of Three Hull Forms

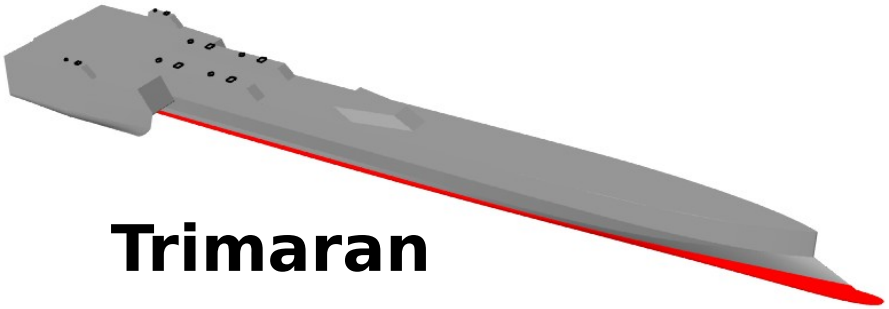


Monohull

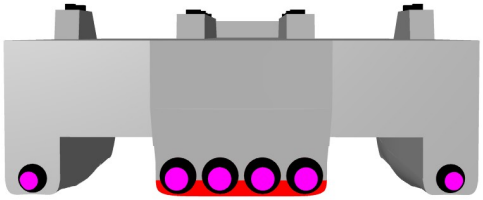


Catamaran





Trimaran



Summary Characteristics of Concept Ships

	MONOHULL	CATAMARAN	TRIMARAN
WATERLINE LENGTH, ft (m)	955 (291.1)	869 (265.1)	1,170 (356.9)
BEAM OVERALL, ft (m)	96.3 (29.36)	197 (60.0)	197 (60.0)
DEPARTURE DRAFT, ft (m)	24.1 (7.34)	26.9 (8.19)	26.3 (8.03)
MIN. ARRIVAL DRAFT. Ft (m)	21.1 (6.42)	24.4 (7.44)	23.7 (7.23)
DEPTH TO MAIN DK, ft (m)	91.8 (28.0)	87.0 (26.54)	84 (25.65)
GROSS CARGO AREA, sq. ft.	225,000	217,000	218,000
INSTALLED POWER, Mw	250	300	260
	5 x MT 50	6 x MT 50	4 x MT 50, 2 MT30
MAXIMUM SPEED, Knots	43.0	43.3	42.3
PROPULSIVE EFFICIENCY	0.71	0.71	0.71
RANGE @ Speed, N. mi.	5,000 @43	5,000 @ 43	5,000 @42
LIGHT SHIP WEIGHT, mt	19,205	22,445	19,830
FULL LOAD DISPL., (mt)	34,840	39,100	35,740
CARGO, tons (mt)	10,000 (9,075)	10,000 (9,075)	10,000 (9,075)

Conclusions

- **All three hull-forms technically feasible**
- **Further development recommended:**
  - Very preliminary, quick/rough effort, need more interaction with users for insight to trade-offs, eg; speed/draft/payload/range, Single ship or multi-ship transport of a UA
- **Cost should be considered**

FastShip Inc.

FastShip Artist's Conception

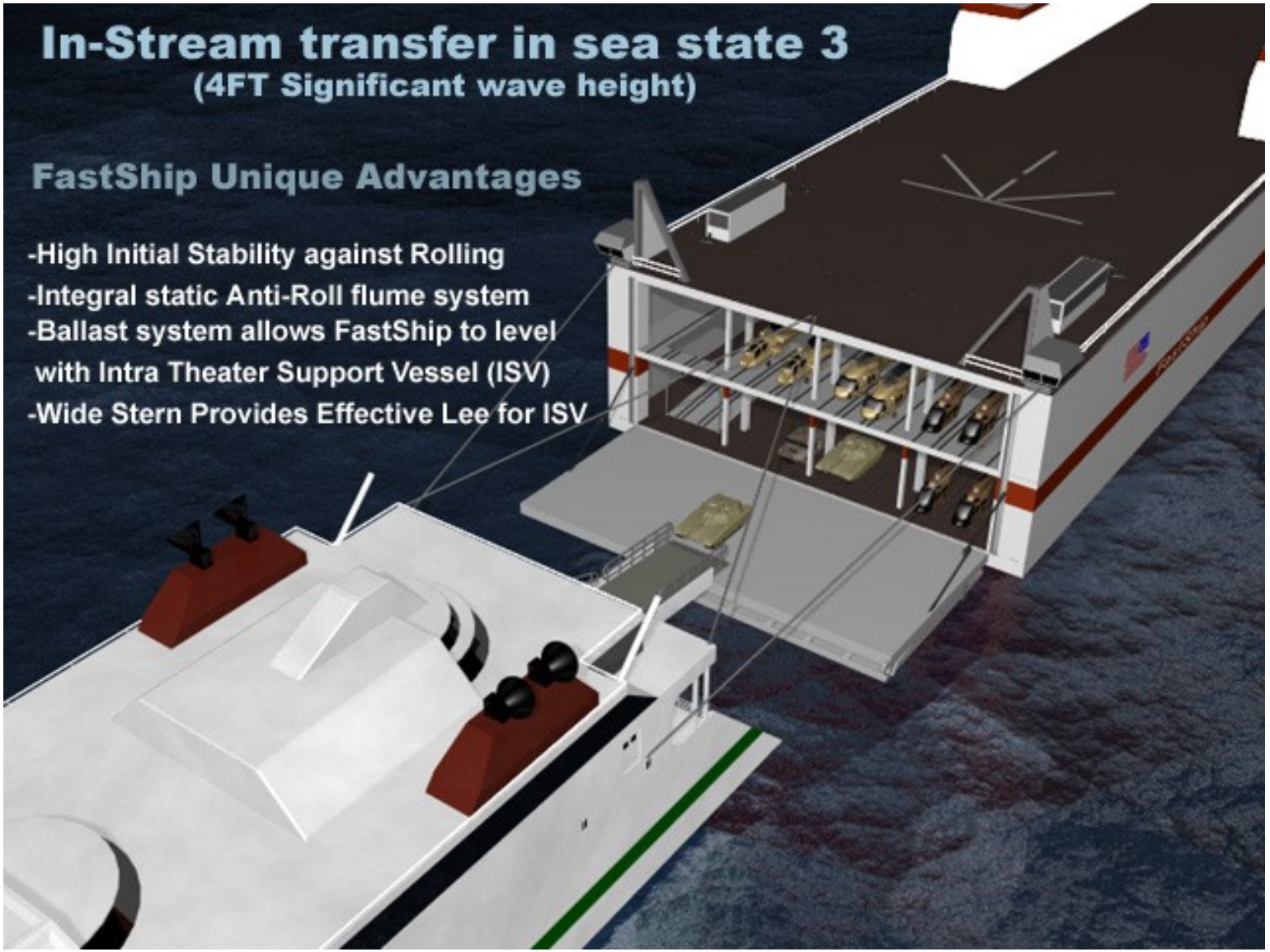
FastShip NDFs

- **Moderate-sized Commercial Vessel Developed To Dramatically Improve Ship Service For High-Value Time Sensitive Cargo.**
- **Semi-Planing MonoHull Design**
  - 36 -38 Kts / 300KHp
  - 35,000 Displacement Tons
    - Approx. 10,000 LT payload
  - 4,000 -10,000 NM Range
- **Specialized Horizontal Ro/Ro Loading System = Reduced Ship Turnaround**
- **Capable of High Speeds in High Sea States**

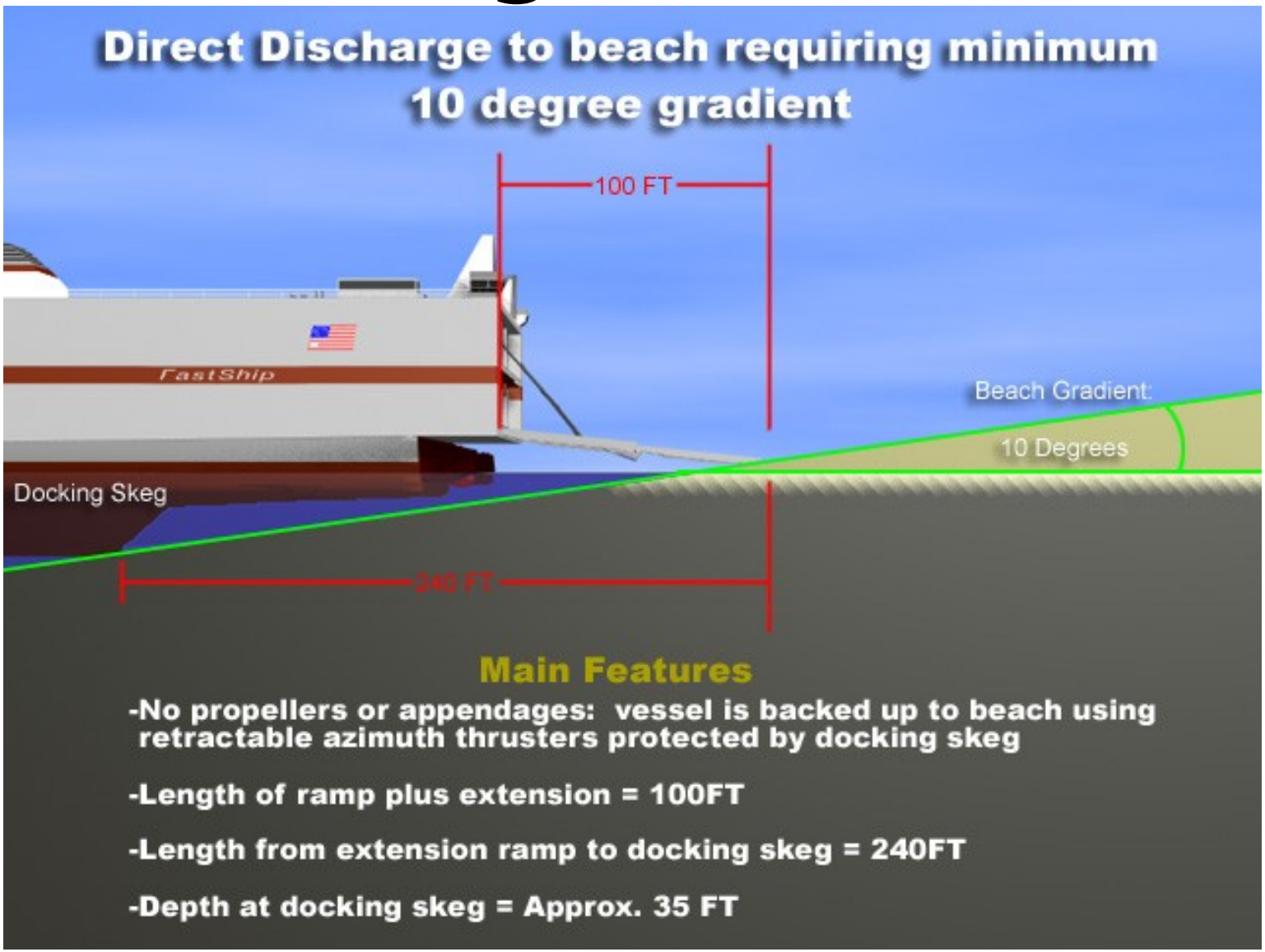
FastShip NDFs

- **NAVSEA/OPNAV/FastShip, Inc.**
- **Military Utility**
  - 9,000 LT Payload
  - 8,700 NM
  - Approx 20 Day Round Trip (LMSR = 34 Days)
- **Study Applicable NDF**
  - Concentrate On Speed/Range/Payload
  - Reduce Load/Unload Characteristics = Minimize Turnaround Time
  - Capitalize On Smaller Size and Draft - Accessibility To Smaller/Underdeveloped Ports

FastShip In-Stream Transfer

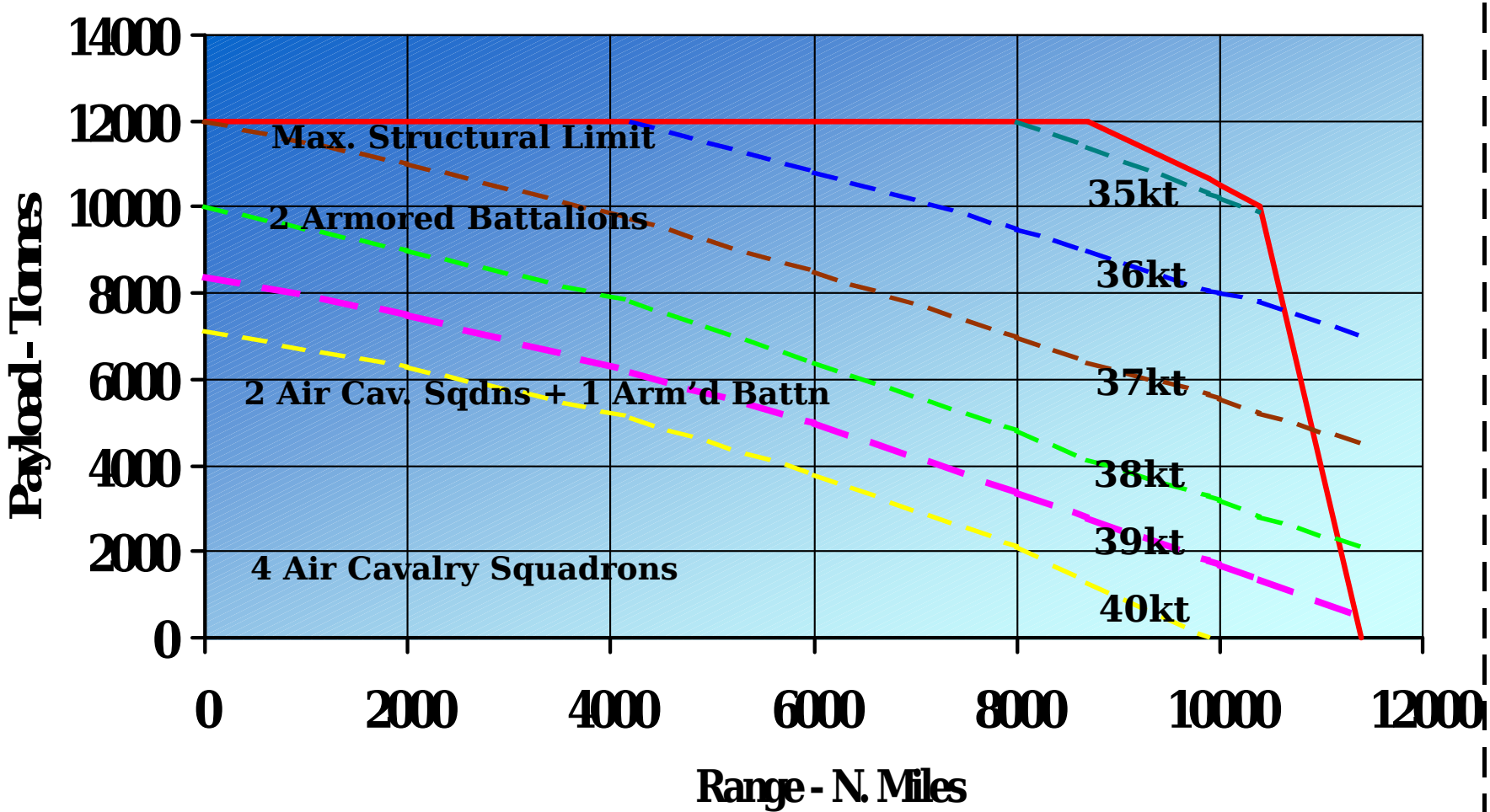


FastShip Direct Discharge To Beach



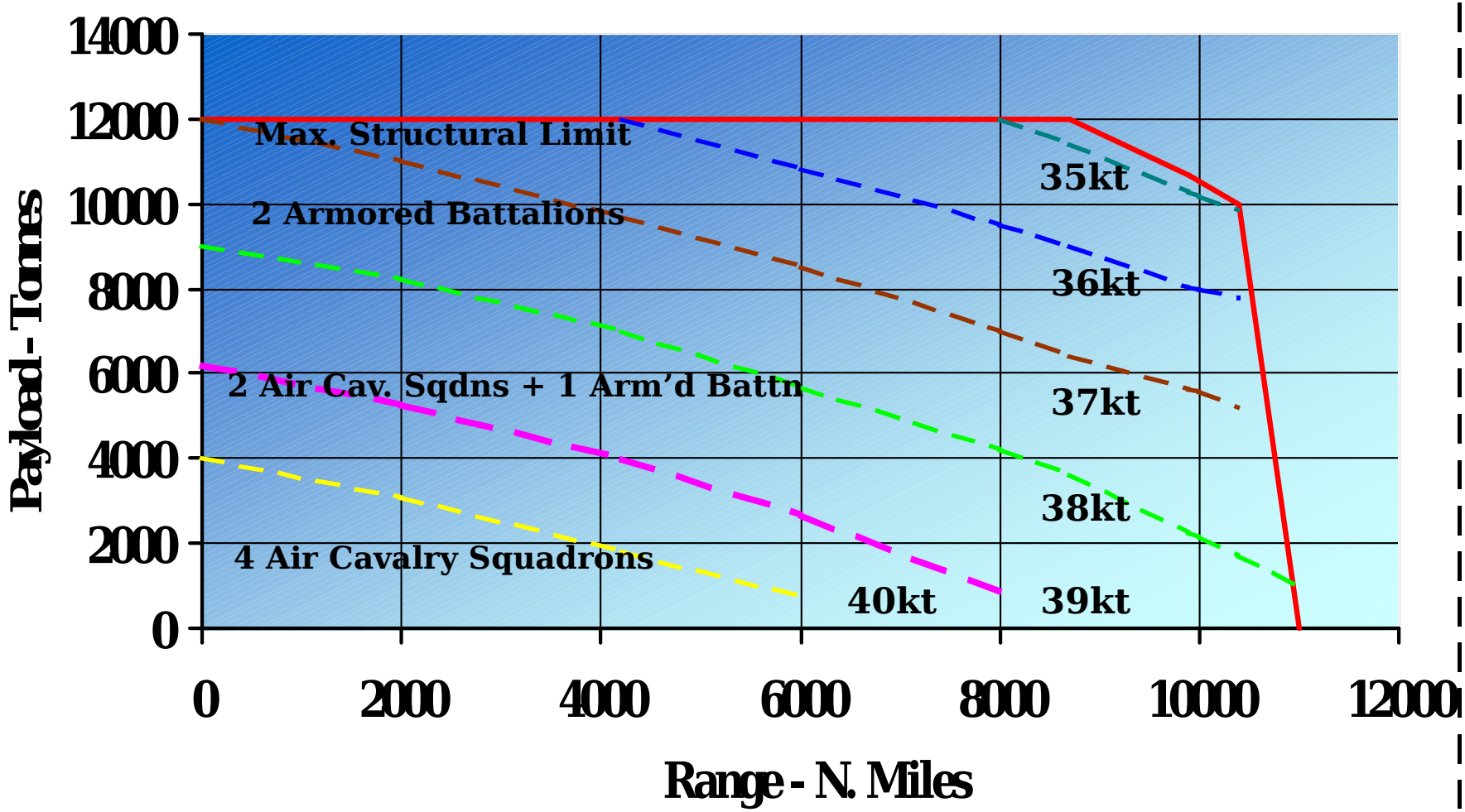
FastShip – Military Payload Vs. Range

1.5 Metre Sig. Wave Ht., Head Seas, 40 > 35 knots



FastShip – Military Payload Vs. Range

4 Metre Sig. Wave Ht., Head Seas, 40 > 35 knots



FastShip Status

- Congress proposes FY04 legislation for Navy to give FastShip mortgage guarantees using $30M in previous appropriations
- SECNAV objects to Navy involvement in commercial ship guarantees
- FastShip restructures project for 100% overseas construction without NDF's
- Shipyard contract in Spain pending final financing arrangement (Late 04)

Summary

- Navy strategic sealift programs of the 80's and 90's fully met ODS and OIF requirements
- Future sealift programs to be determined by Mobility Capabilities Study

Questions?

BACK UP

Near-Term Technology

- 60,000 HP Gas Turbines
- Waterjet Propulsors
- Mechanical Power Transmissions
- Hulls of Steel

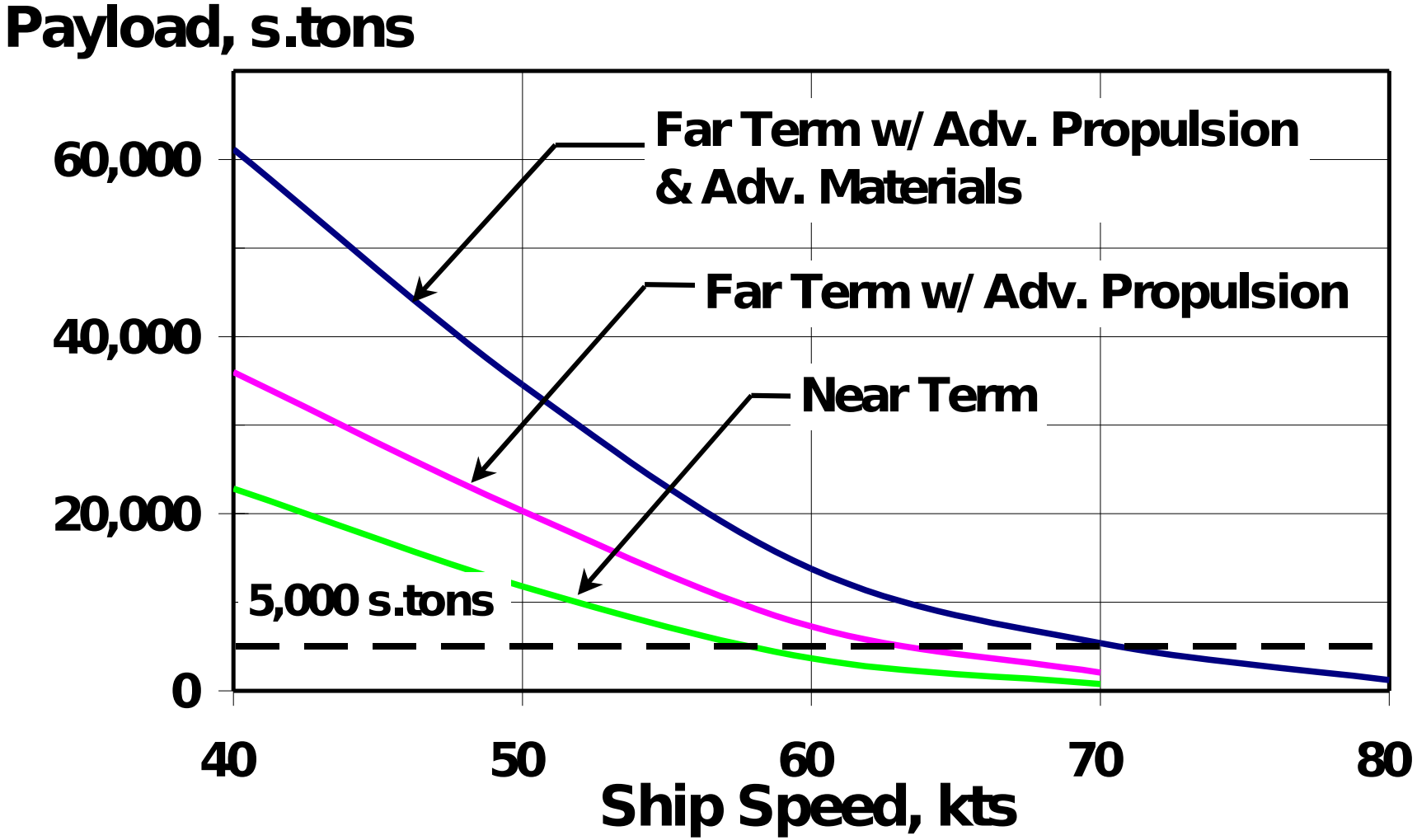
(Available Within 5 Years)

Mission Parameters Of Interest

- **Speed: 40 to 100 Knots**
- **Range: 500 to 10,000 Nautical Miles**
- **Cargo: 500 to 5,000 Short Tons**

  10,000 to 150,000 Square Feet
- **Draft: Austere Port/Shallow Draft**

Payload Versus Speed for Range = 5,000 nm



Power Projection Platform Upgrades ≠ Port Upgrades

50% increase in Rail Loading capacity at Ft Hood due to rail head upgrades

FT HOOD

BEAUMONT

CORPUS CHRISTI

Choke Point – Rail Capacity

Bottom Line:
- **Synchronize**
- **Communicate**
- **Port Calls**

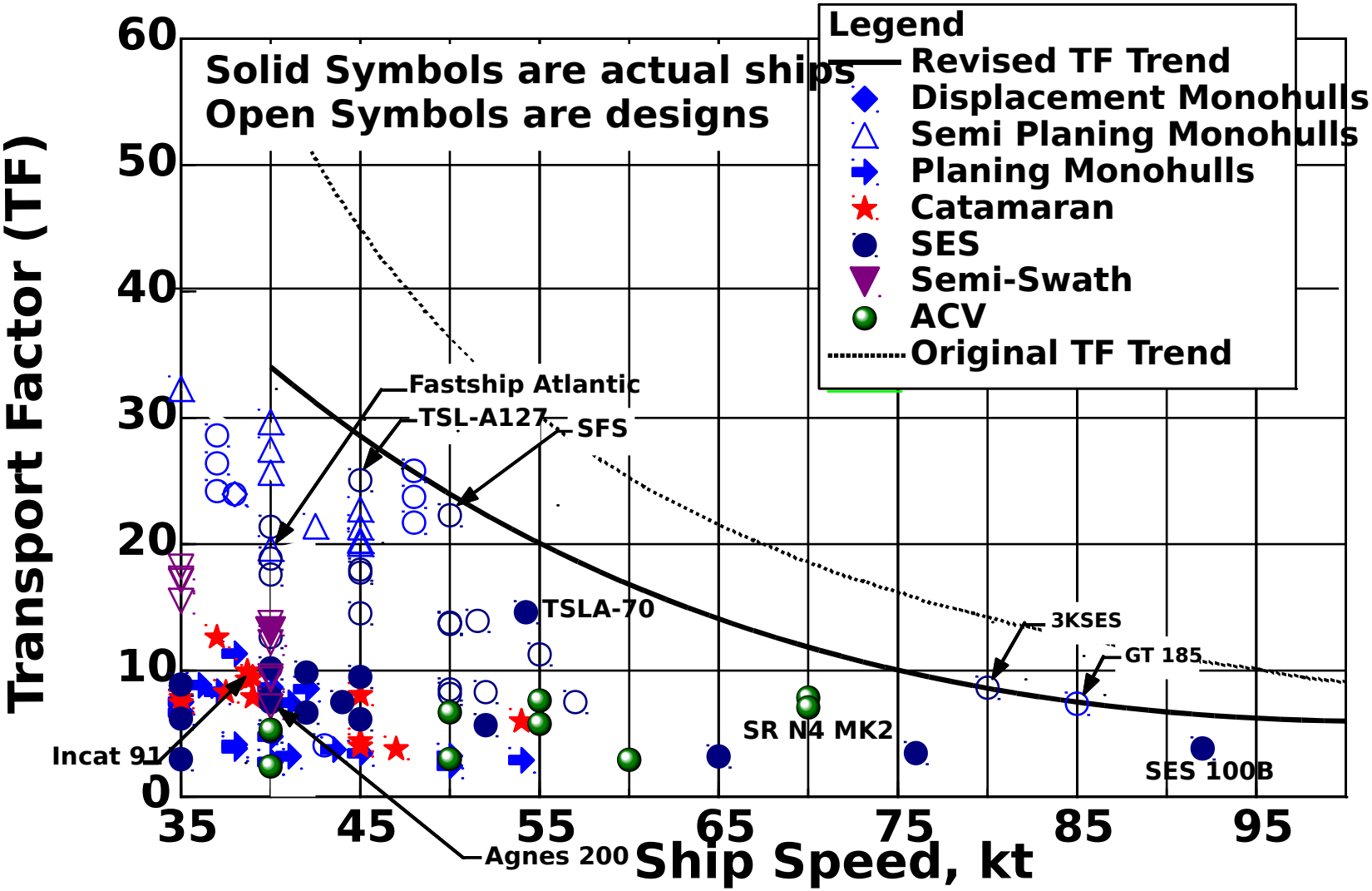
Need to Improve Fort-to-Port Infrastructure

MTMC OIF Concurrent Surface Operations

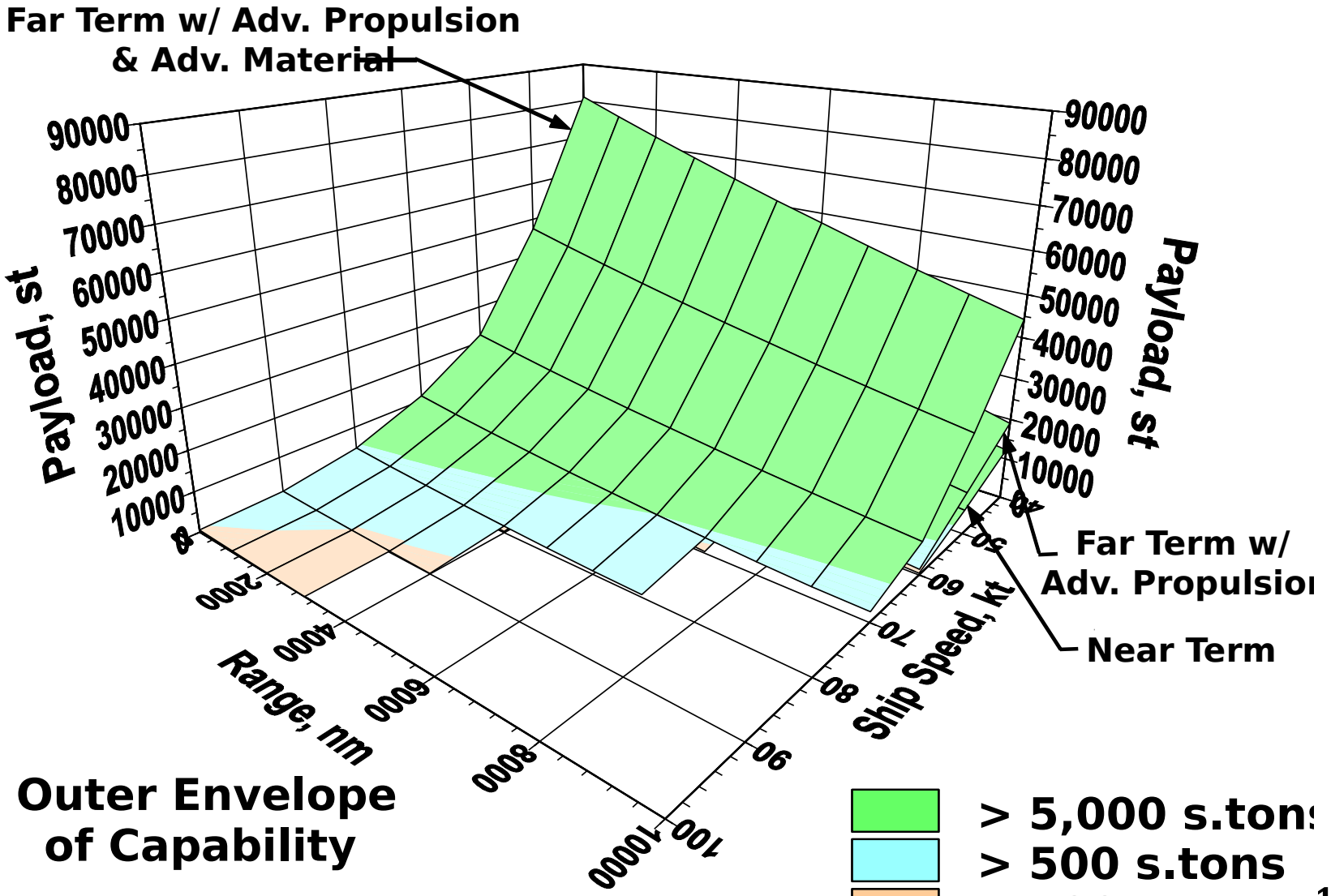
- Operations at 13 Power Projection Platforms
- Operations at 26 Seaports
- Coordinated the Movement of Over 18,000,000 Sq Ft
- Over 18,000 Ammunition Shipments Moved to the Ports
- Over 17,000 Railcars Moved Through Commercial Ports
- Worked Over 199 Vessels Connected With Operation Iraqi Freedom
- 50 Stevedoring and Related Terminal Services Contracts/BOAs In Place
- Over 108,500 Truck Shipments Moved to Ports

Leverage all Modes of Transportation

Transportation Factor Curve



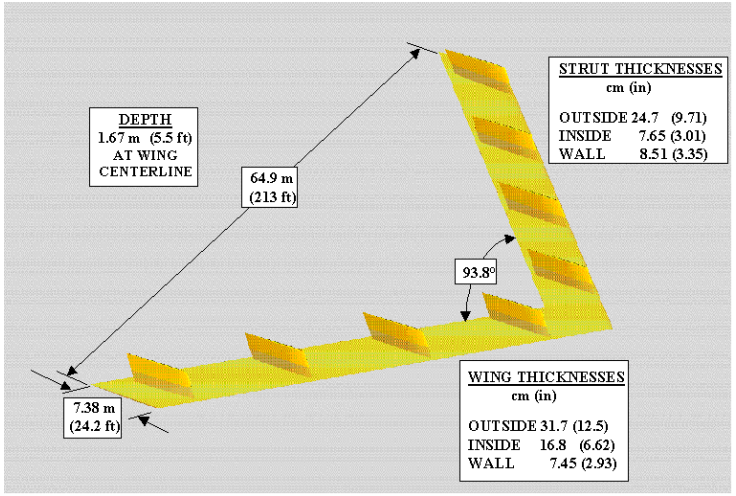
Near and Far-Term Results



Challenge: Recapitalize Organic Fleet

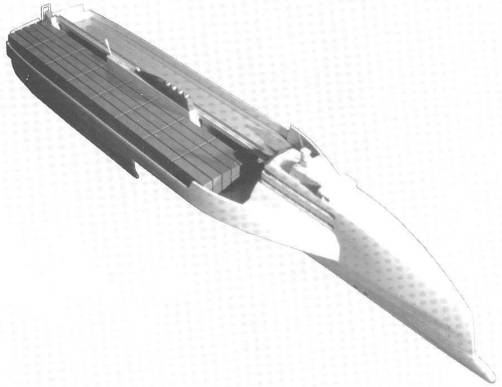
ONR's Fast Ship Program

PACIFIC MARINE



LOCKHEED MARTIN

VIBTECH/HARLEY



BATH IRON WORKS

Army Objective Force

- **Army Requires Shallow Draft High Speed Transport - “80-100Kt Ships”**
  - Deploy Worldwide Fort to Foxhole in 5 Days
- **Currently No Validated Requirement**
- **Army Exploring Concepts to support 10-30-30 (e.g. 6 U of A’s by D+20)**
- **High Speed Transport Workshop Held Oct ‘97 @ NSWC, Carderock**
  - Summarize State Of The Art
  - Analyze Speed, Range, Payload, Hull Forms
  - Develop Technology Investment Plan

Broad Conclusions From High Speed Transport Workshop

- Recent Commercial Development in Medium Speed Seaborne Transportation has been Significant
- No Break-Throughs in Physics were identified
- Significant Performance Improvements in Sealift Mission are possible with Technology Projections made by Working Groups

FUTURE OF HIGH SPEED SEALIFT

- **High Speed Sealift/Agile Port Executive Steering Committee**
- **MOA Between: OPNAV (N42), NAVSEA (PEO EXW), US Army, US Transportation Command**
  - **Share Information and interests**
  - **Integrate Operational Concepts and Requirements with Technical Development**
  - **Expedite acquisition**
  - **Assess progress towards goals**
  - **Coordinate R&D and investment programs**

HIGH-SPEED SEALIFT TECHNOLOGY DEVELOPMENT ROADMAP

HSST WORKSHOP

- technology assessments
- near and far-term projections
- performance predictions

post workshop analysis

TECHNOLOGY INNOVATION TEAM

- User requirements
- parametric studies
- synthesize technologies
- total ship concepts
- technology shortfalls

TECHNOLOGY DEVELOPMENT PLAN

- technology priorities
- investment POA&M

STUDIES

- ship size impact
- machinery plant
- cargo handling
- structural concepts
- cargo density
- prior TDP review

ADVANCED MOBILITY CONCEPTS STUDY

- SDHSS
- Monohull HSS

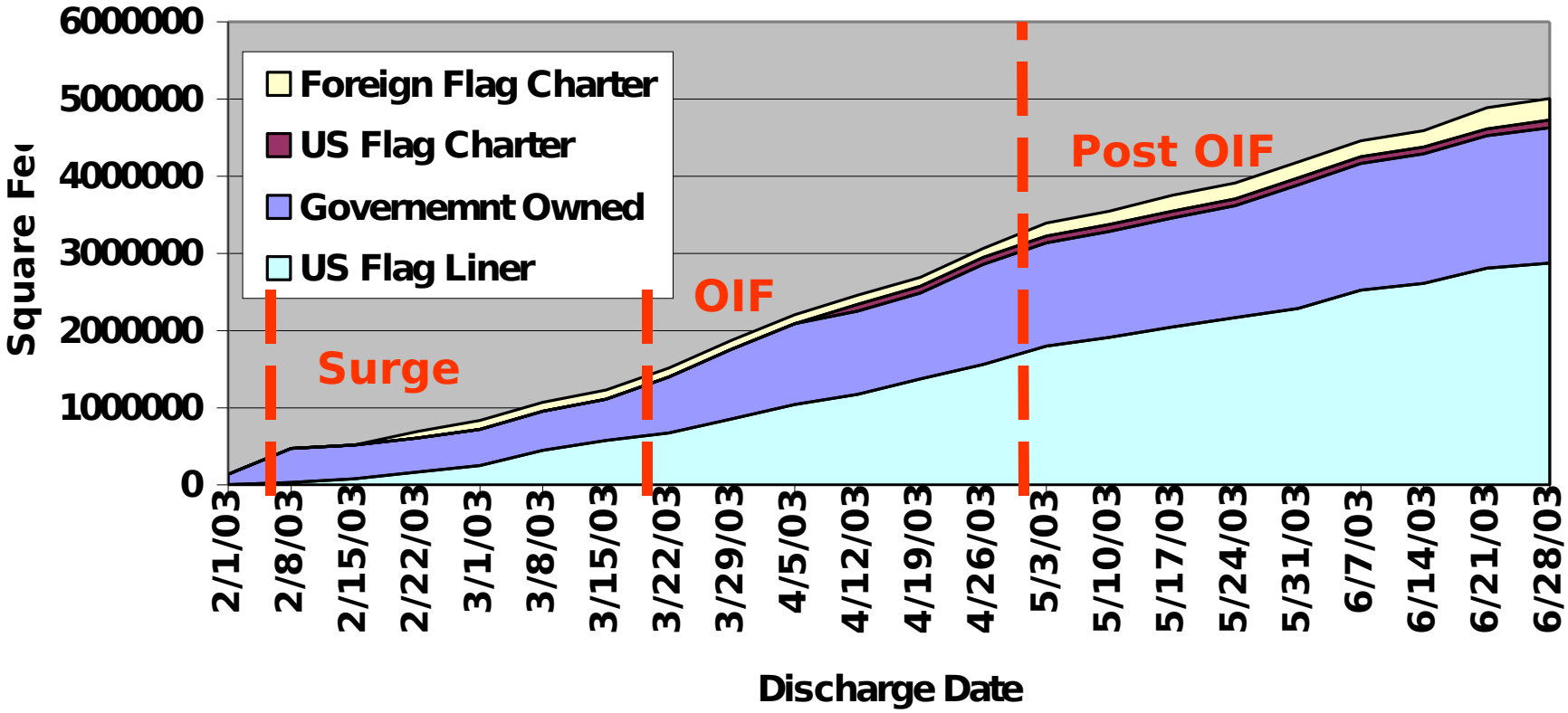
Mission Summary

	Shuttle Ship 1a	Shuttle Ship 1b	Intra-Theater Support Ship 2a	Intra-Theater Support Ship 2b	Coastal Commercial Ship 3	Trans-Ocean Commercial Ship 4a	Trans-Ocean Commercial Ship 4b	Inter-Theater Ship 5
Average Speed (knots)	40	45	40	40	50	50	60	40
Full Performance Wave Height (m)	2.4	2.4	2.4	2.4	2.4	4	4	4
Range (nm)	1,250	1,250	800	1,200	1,500	4,000	4,000	5,000
Payload (mt)	1,497	1,497	454	454	1,500	7,500	7,500	5,445
Ramp Requirements	y	y	y	y	n	n	n	y
Total Crew	20	20	20	20	20	30	30	30
Structural Technology	current	current	current	current	current	far	far	near
Waterjet Technology	current	current	current	current	current	far	far	near
Prime Mover Technology	current	current	current	current	current	far	far	near

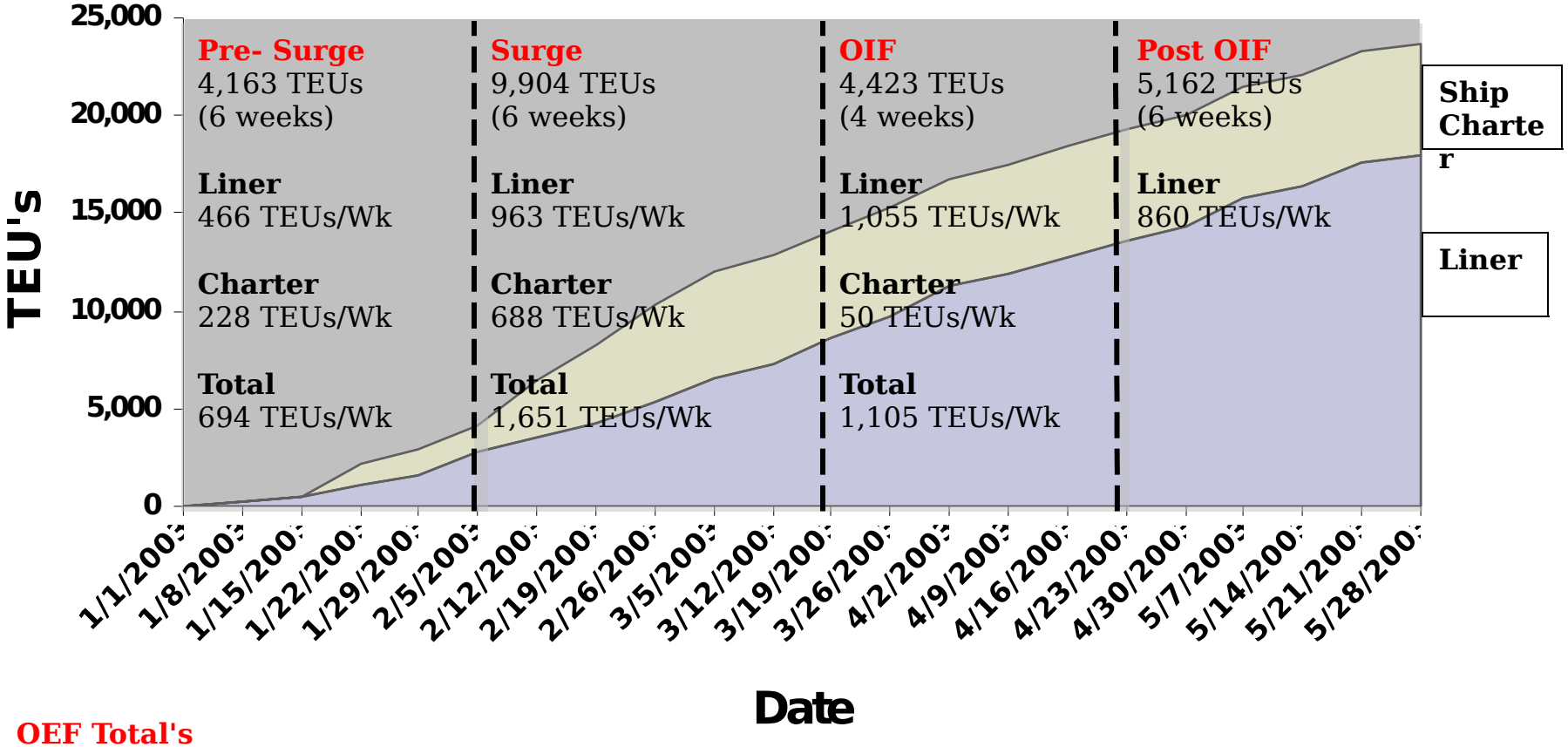
	Vision Ship 70 knots 6a	Vision Ship 60 knots 6b	Vision Ship 55 knots 6c	Vision Ship 5,000 st 7a	Vision Ship 7,500 st 7b	Intra-theater Ship 8	Logistics Ship 9
Average Speed (knots)	70	60	55	55	55	40	50
Full Performance Wave Height (m)	4	4	4	4	4	2.4	2.4
Range (nm)	5,000	5,000	10,000	8,700	8,700	800	1,000
Payload (mt)	4,537	11,797	11,797	4,537	6,806	1,312	726
Ramp Requirements	y	y	y	y	y	y	y
Total Crew	30	30	30	30	30	20	20
Structural Technology	far	far	far	far	far	near	near
Waterjet Technology	far	far	far	far	far	near	near
Prime Mover Technology	far	far	far	far	far	near	near

High Speed Sealift Technology Plan developed by Carderock Division Naval Surface Warfare Center

OIF Closure

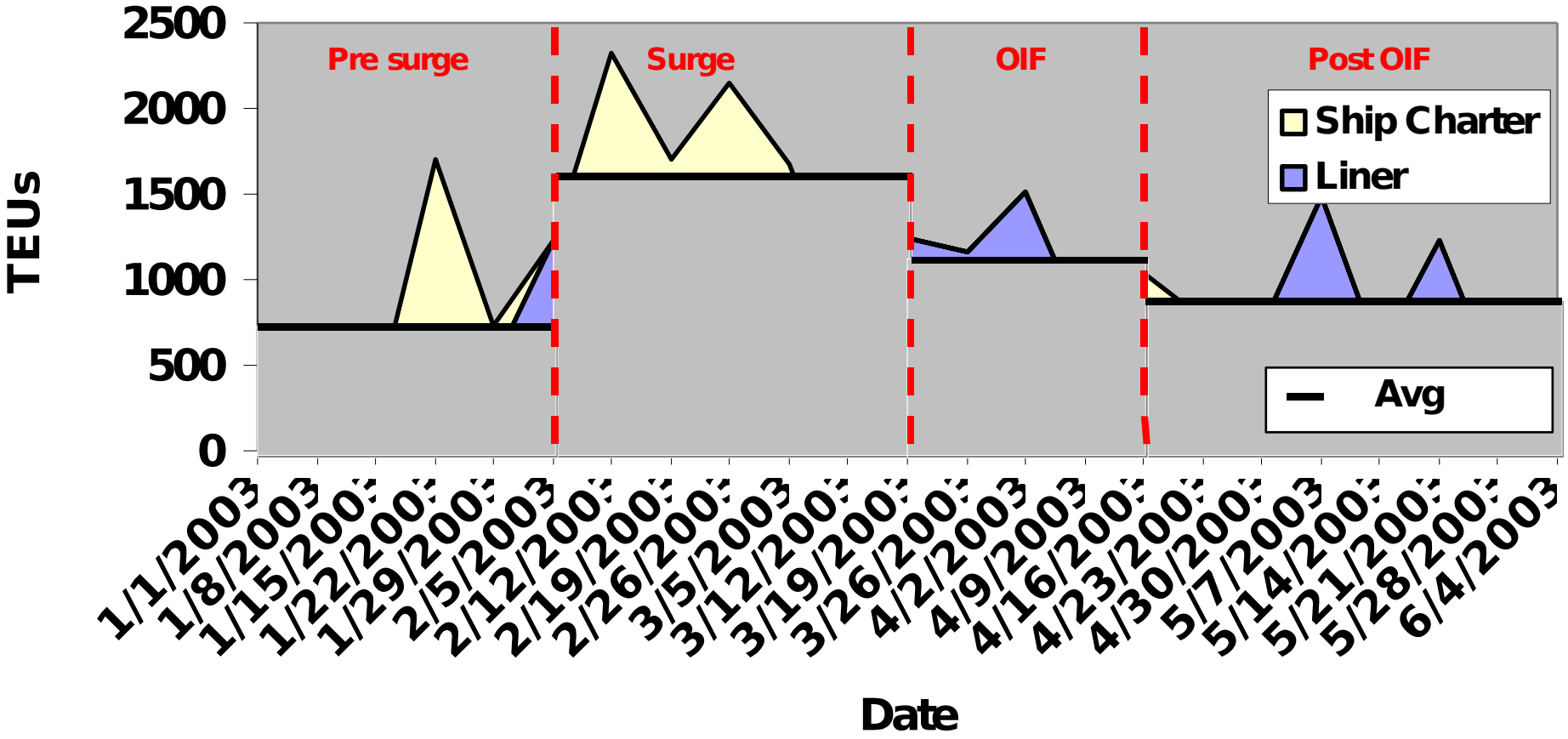

6000000
5000000
4000000
3000000
2000000
1000000
0
Square Fe
Foreign Flag Charter
US Flag Charter
Governemnt Owned
US Flag Liner
Surge
OIF
Post OIF
2/1/03
2/8/03
2/15/03
2/22/03
3/1/03
3/8/03
3/15/03
3/22/03
3/29/03
4/5/03
4/12/03
4/19/03
4/26/03
5/3/03
5/10/03
5/17/03
5/24/03
5/31/03
6/7/03
6/14/03
6/21/03
6/28/03
Discharge Date

OEF TEUs Shipped from CONUS

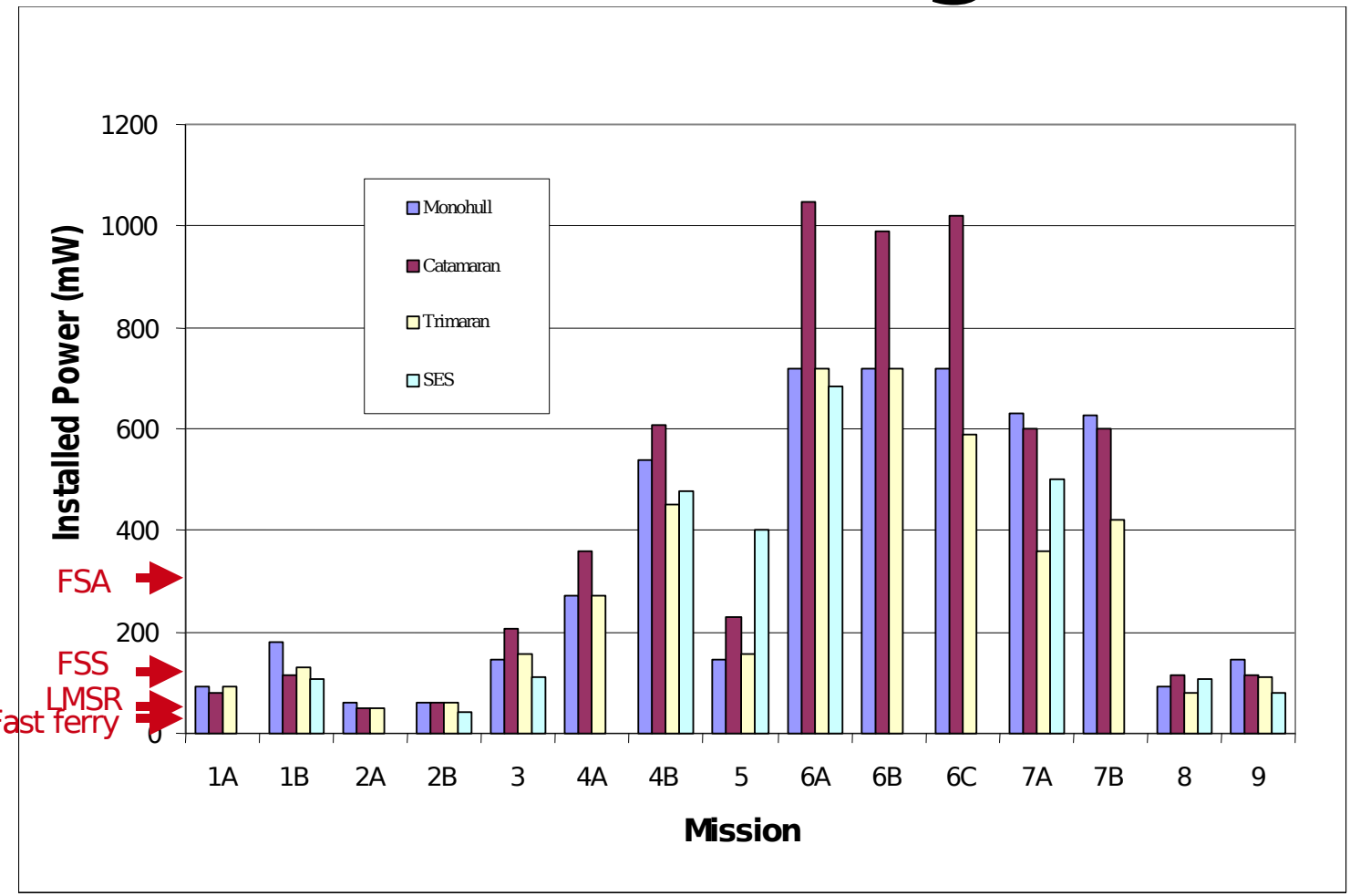


OEF Total's

OEF TEU Flows from CONUS

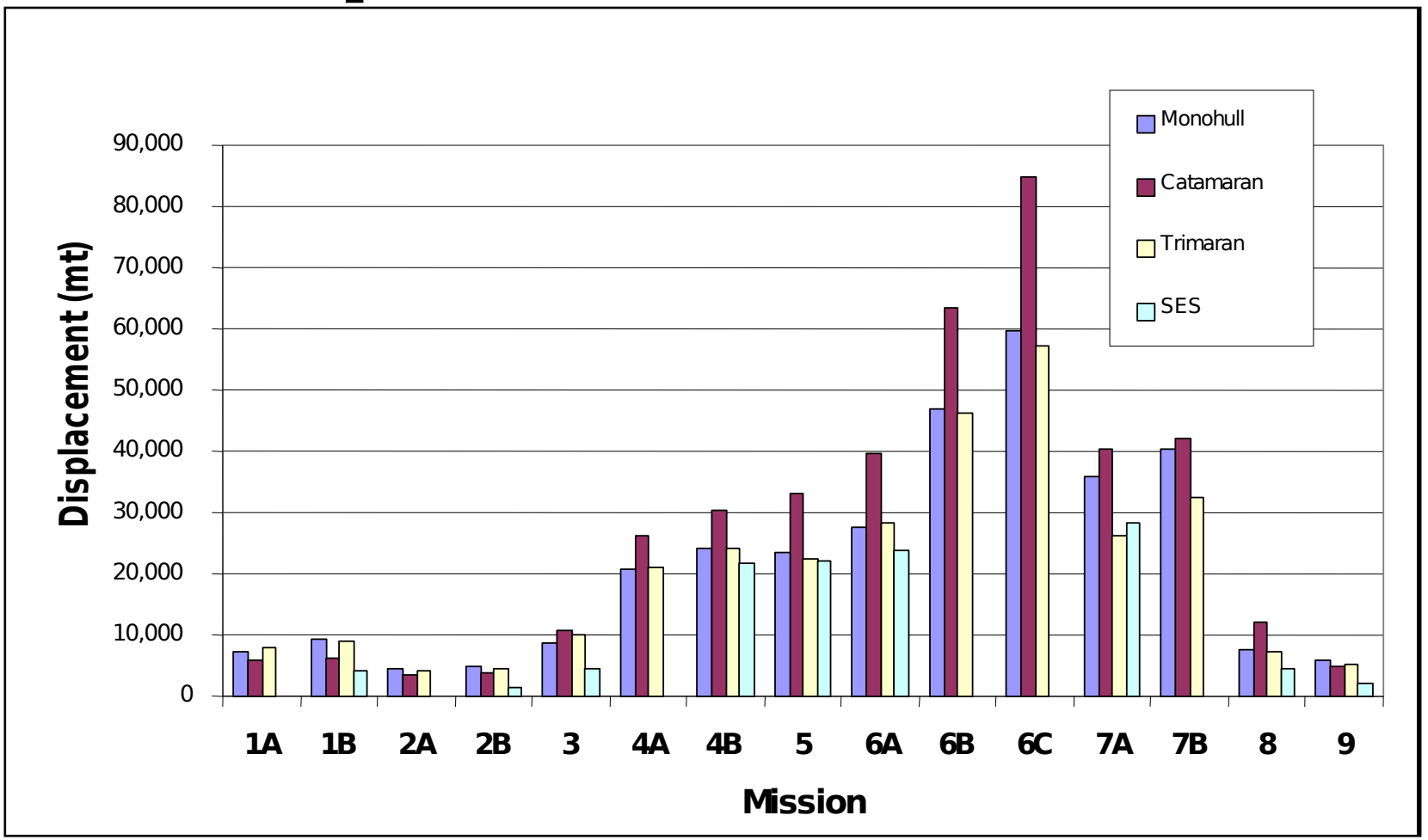


Installed Power of HSS Designs



High Speed Sealift Technology Plan developed by Carderock Division Naval Surface Warfare Center

Full Load Displacement of HSS



High Speed Sealift Technology Plan developed by Carderock Division Naval Surface Warfare Center